GATHERING *for* OPEN SCIENCE HARDWARE

A FRAMEWORK FOR RUNNING COMMUNITY EVENTS

WRITTEN BY
JULIETA ARANCIO
MARCELA BASCH
SHANNON DOSEMAGEN
JENNY MOLLOY

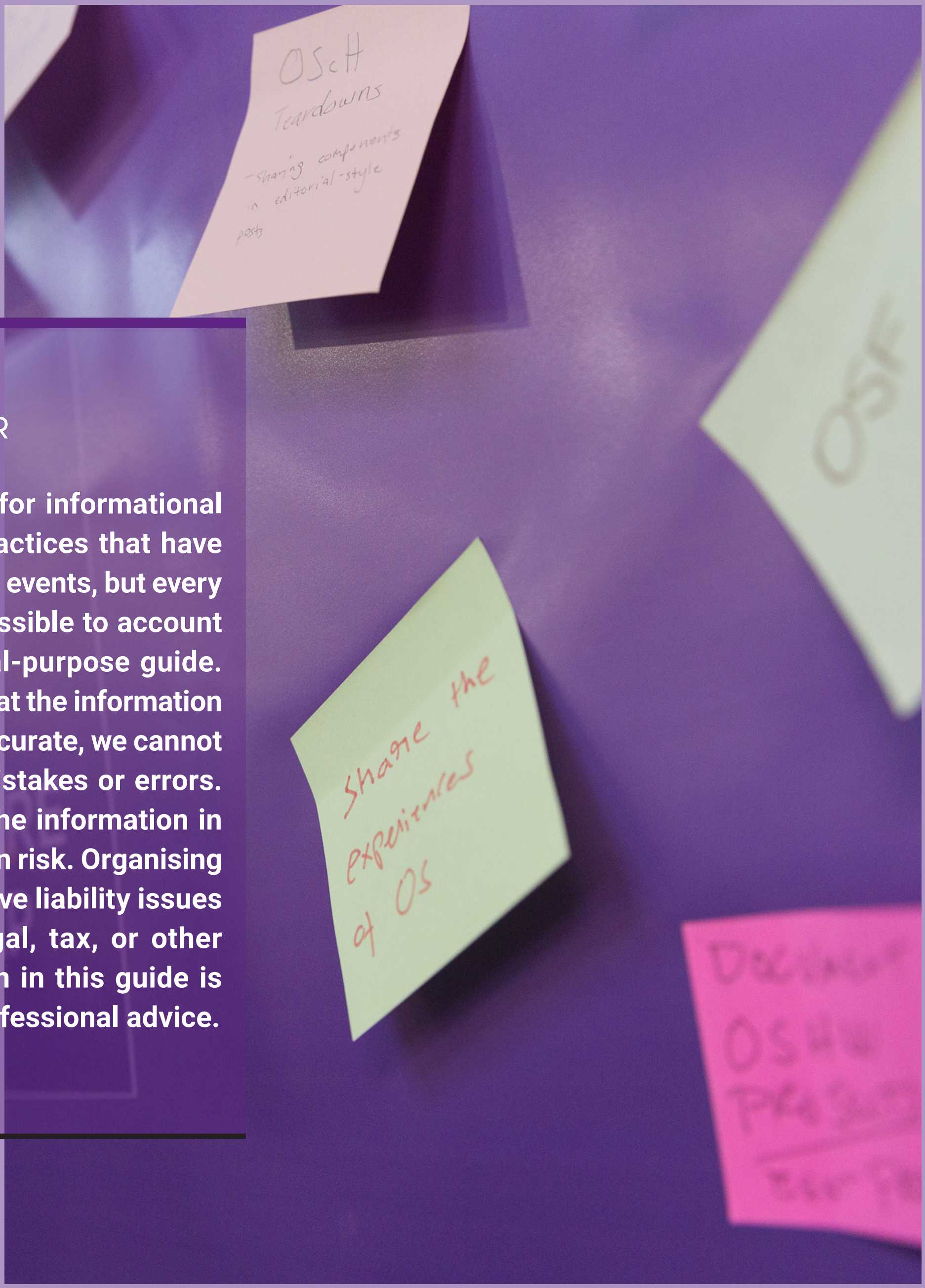
WITH EDITORIAL SUPPORT FROM
BRIANNA JOHNS

DESIGN BY
MARÍA DEL CARMEN LAMADRID

Gathering for Open Science Hardware

DISCLAIMER

This events guide is provided for informational purposes only. It describes practices that have worked for us in organising past events, but every event is different and it's impossible to account for every situation in a general-purpose guide. While we have tried to ensure that the information in this guide is complete and accurate, we cannot guarantee that there are no mistakes or errors. Should you decide to rely on the information in this guide, you do so at your own risk. Organising and running an event may involve liability issues that require the advice of legal, tax, or other professionals. The information in this guide is not a substitute for legal or professional advice.



Wall with sticky notes during 2018 Gathering in Shenzhen.

TABLE OF CONTENT

FOREWORD AND ACKNOWLEDGEMENTS

On April 21, 2021, the GOSH community convened a virtual workshop that brought together 17 participants, including previous Global GOSH events' organisers plus a limited number of GOSH community members that have participated in these events.

The goal of the workshop was to collaboratively build the foundations of a framework for future GOSH gatherings. After the session, a document containing the draft framework was shared in the GOSH Forum and open for comments, which were later incorporated into this final text.

We want to thank all participants for their valuable contributions to this document. We also want to thank the members of the open science hardware community for their helpful comments and advice on the open draft of this framework.



Attendees at the first GOSH Gathering in 2016, held at CERN.

WORKSHOP PARTICIPANTS

Bri Johns, Gathering for Open Science Hardware (GOSH), US

Thomas Hervé Mboa Nkoudou, MboaLab and University of Yaounde II, Cameroon

Fernan Federici, Pontificia Universidad Católica de Chile (PUC), Chile

Greg Austic, Our-Sci.net, US

Julian Stirling, University of Bath, UK

Allen Gunn, Aspiration

Shannon Dosemagen, Open Environmental Data Project, US

Jenny Molloy, University of Cambridge, UK

Marcela Basch, El Plan C, Argentina

Nano Castro, Cooperativa Ayllu - Universidad Tecnológica Nacional, Argentina

Marc Dusseiller, Hackteria, Switzerland

Ji Li, Open FIESTA, Tsinghua University, China

Francois Grey, University of Geneva, Switzerland

Ryan Fobel, Sci-Bots Inc., Canada

Andre Maia Chagas, University of Sussex, UK

Urs Gaudenz, GaudiLabs, Switzerland

Julieta Arancio, CENIT-UNSAM, Argentina

This document was written by Julieta Arancio, Marcela Basch, Shannon Dosemagen and Jenny Molloy with editorial support from Brianna Johns. Publication design by Maria Lamadrid.

The content of this document is licensed under CC BY 4.0.

This work was made possible by support from the Alfred P. Sloan Foundation to Gathering for Open Science Hardware, Inc.

WELCOME!

In this guide you will find a compilation of lessons learned from running GOSH global events since 2016, by the GOSH community[1]. It is our intention that this guide becomes a useful tool for those running regional or local GOSH events in the future.

You may be part of a regional GOSH network, planning your next community event. Or maybe you recently joined GOSH and you want to run a GOSH-like gathering at your community space or university. Whatever type of event you are planning, the content of this guide will help you align it to the values in the GOSH Manifesto, leveraging the GOSH spirit!

WHY THIS GUIDE?

Events have been central and essential to the establishment and development of GOSH as a community. This got us thinking... How do we empower people to effectively run GOSH events? Either when organising events to promote open science hardware in local contexts, or when working on specific topics related to the GOSH roadmap, how do we preserve the values and energy of larger GOSH gatherings?

This is where the guide comes into play: we are documenting a framework for those who want to run regional, local or domain-specific events. By doing so, we aim to encourage new people to become organisers both for the global GOSH event and to take parts of the model and implement it regionally and topically.

This is a living document. Its first version is the result of a workshop that gathered organisers of previous GOSH gatherings and regional community members, where they identified the key elements that make a GOSH event special. The document was also opened to the whole community for comment before finally publishing its first version.



Violet Su introduces Seeed Studio's work in open hardware during a presentation at the 2018 GOSH Gathering held in Shenzhen.

HELP US IMPROVE THIS GUIDE

If you have any suggestions to improve this document, please visit the GOSH forum thread: "Documenting a framework for organising GOSH events".[2]

SOME EXAMPLES OF GOSH REGIONAL AND DOMAIN-SPECIFIC COMMUNITIES



AFRICAOSH

AfricaOSH[3] is a regional GOSH community that was born after the GOSH global event of 2017. Its first edition in 2018 was held in Ghana, moving to East Africa with the 2019 edition in Tanzania.

REGOSH

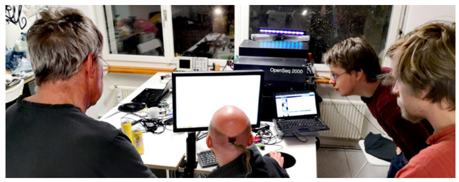
REGOSH

After the GOSH global event in 2018, GOSHers from Latin America founded reGOSH[4], a regional GOSH community. The network started running "GOSH residences" where people gather during four weeks to build hardware collaboratively. After the first residency in Brazil in 2019, it is now also expanding to other formats.



GREAT LAKES GOSH

In Toronto, Canada, the first Great Lakes GOSH[5] was held in 2019 with the aim of fostering collaboration and identifying ways to support participants and collaborate more effectively.



RESEQ PROJECT

In Switzerland, GOSHers from Europe met to organise a crowdfunding campaign[6] to support work on the ReSeq[7] project, or reuse of an old DNA sequencer to turn it into an open science hardware instrument.

BOING
Bath Open
INstrumentation Group

BATH OPEN INSTRUMENTATION GROUP (BOING)

In February 2020, just before the COVID-19 pandemic arrived in the UK, the **Bath Open Instrumentation Group (BOING)** organised a 3-day workshop[8] where participants explored different aspects of open hardware in academia.

Images (clockwise): Group photo from AfricaOSH. The ReSeq-Kickstarter group. Logo of the Bath Open INstrumentation Group (BOING). Group photo from Great Lakes GOSH 2019. Logo for reGOSH.

HOW DOES IT WORK?

The content in this guide is laid out in order to be useful for event organisers. It is divided into three main sections: things you have to consider and do before, during, and after the event. This way you can easily access what needs to be done and when at a glance.

You will notice that the number of things to take into account and do before the event is much larger than during or afterwards. If you're considering organising an event, you can also use this guide to understand the amount of work involved and how many people you will need in the organisers' team.

EACH SECTION CONTAINS:

- A description of the key elements that we recommend you consider
- Illustrative examples from past GOSH events
- Links to templates we have used in the past, when available.

You will see that some elements are tagged with different icons. These icons link elements in the GOSH events framework to values in the GOSH Manifesto[9].

GOSH MANIFESTO

The Global Open Science Hardware (GOSH) movement seeks to reduce barriers between diverse creators and users of scientific tools to support the pursuit and growth of knowledge. These are our principles:

- GOSH is accessible
- GOSH makes science better
- GOSH is ethical
- GOSH changes the culture of science
- GOSH democratises science
- GOSH has no high priests
- GOSH empowers people
- GOSH has no black boxes
- GOSH is impactful tools
- GOSH allows multiple futures for science

The GOSH Manifesto was created by consensus with people from the first GOSH meeting in 2016 in Geneva, Switzerland. It's creation was facilitated by Max Liboiron and Greg Austic, who remain the caretakers of the document.

To read the full description of each value or sign the manifesto **please visit the GOSH Manifesto webpage**[10].

THE “GOSH SPIRIT”

For those who attended GOSH events in the past it is easy to go back and identify the special, characteristic community feeling that emerges when we are together. In an attempt to share at least some of this “GOSH spirit” with our readers, we’ve compiled the main reasons why our community considers GOSH events so special.

THE DIVERSITY OF PEOPLE

Diversity of participants plays a big role in making GOSH events special. Although GOSH is all about open science hardware, participants are not limited to those with a technical background. They are an intentional mix of tech people but also educators, artists, researchers, entrepreneurs and activists working on different aspects of open science hardware. There is an emphasis from organisers on ensuring underrepresented groups in science & tech have a place at GOSH, including all regions during GOSH global events, gender-balanced participation, and people from across the spectrum of science. This makes for great conversations, exchanges, learnings and new friendships that participants remember well after the event is over.

> *“Doing with others is a very organic thing: if you try to structure and control very much it gets harder, and, on the other hand, if it’s too unorganised, the event could simply never happen. You have to find that magic balance.”*
>
> **MARINA DE FREITAS**

A MIXED AGENDA

The activities that take place during a GOSH event usually include a mix of discussion sessions and hands-on activities. Hands-on formats include workshops, demos, show & tell sessions that intertwine with discussions on important topics to advance the GOSH roadmap. Participants are welcome to attend a session, move to another one, start their own. This flexibility allows everyone to participate and contribute in the format they feel most comfortable with, while keeping the group energy up.

THE COLLABORATIVE ATMOSPHERE

GOSH events are highly collaborative instances in many different ways. Part of the agenda is defined using an unconference format that allows ideas from everyone to catch the attention of the rest, starting new conversations. All sessions must include a timekeeper, a notetaker and a facilitator, to ensure everyone has a chance to speak. GOSH events are also the best places to find help or new ideas: it is not unusual to see people staying after hours fixing bugs in other participant’s projects, or starting new collaborations. Solidarity and altruism are values that participants often associated with GOSH events.

COLLECTIVE ACTION

The energy and collaborative work that unfold during a GOSH event persist well after the event is over. Previous calls to action at GOSH include publishing and signing the **GOSH Manifesto**[11] (2016), writing the **GOSH roadmap**[12] in a collaborative way (2017), and creating **GOSH working groups**[13] for advancing specific roadmap aspects (2018). The community shares values and goals that guide GOSHers' work during the rest of the year, keeping the momentum going. People discuss and collaborate in specific projects online, and offline when possible, so each event builds on what was achieved before.

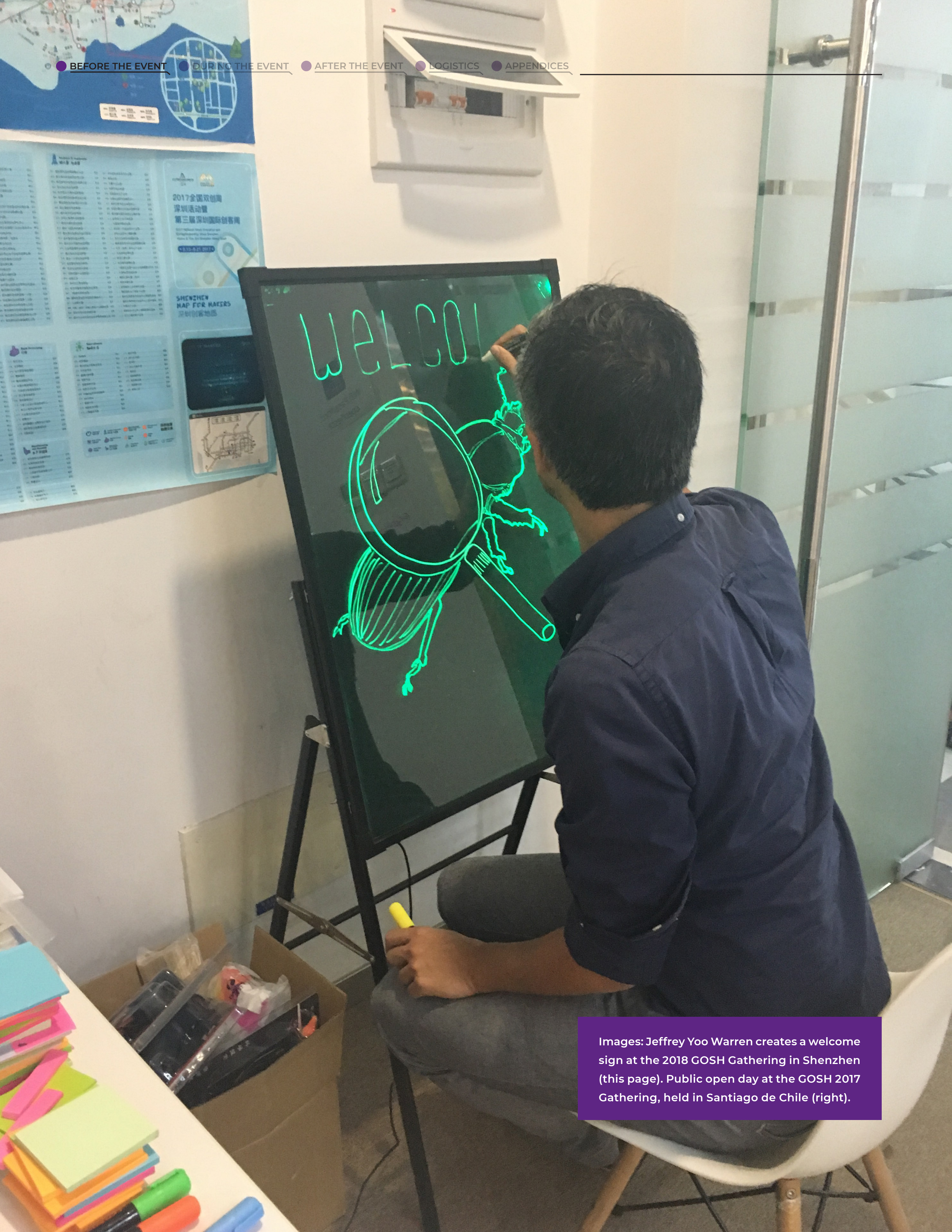
THE FUN

GOSH events are fun, the atmosphere is relaxed. Participants value the low-pressure socialising options and the informal spirit of the gathering. Sharing extra-program activities such as visits to community spaces, hacklabs, organising visits to hardware-related spots or even cooking together, all build a sense of community between participants. People also arrive earlier to the venue and self-organise activities, or connect to other events happening close by, post-event.

> *"To build a sense of togetherness, it's key to ensuring the in-between times: eating together, listening to music, socialising... When some people can be dancing and some others can hack something in the same space, that builds an atmosphere not too rigid and strict, and allows people to find their spots."*
>
> **SHANNON DOSEMAGEN**



Wall of photos taken during 2018 Gathering in Shenzhen.



Images: Jeffrey Yoo Warren creates a welcome sign at the 2018 GOSH Gathering in Shenzhen (this page). Public open day at the GOSH 2017 Gathering, held in Santiago de Chile (right).

CHAPTER 01

BEFORE THE EVENT



GOSH ALLOWS MULTIPLE FUTURES FOR SCIENCE

WHAT TYPE OF EVENT DO YOU WANT TO ORGANISE?

The type of event you choose should be tied to why you want to run an event and what impact you want it to have. For example, what needs in your open science hardware community is the event addressing?

According to these needs, some formats will fit better than others. If your goal is deep community building and increasing the density of personal connections in your local open science hardware community, a 3-hour workshop is probably too short and the event would likely be most effective in person. If you are bringing together a group including people from outside the open science hardware community with a concrete goal like outlining a policy brief, a four day event is probably too much of a commitment and it may even work well as a short online event with good collaboration tools.

The possible types of event will also be a compromise between the goals and the resources available. For example, a multi-week residency is unlikely to be feasible if you can't financially support participants with accommodation and travel.

The GOSH community has run a number of different event formats which continue to evolve over time, and are further described in this document. This guide isn't prescribing one kind of event or suggesting that options are limited to those undertaken by the GOSH community in the past; we encourage you to be creative according to the needs of your community. However, we focus most attention on multi-day in-person events and we highly recommend that events of this type have a mixture of these four elements in any proportion: hands-on activity, discussion sessions in groups and plenary, public events/open days, and unstructured time for relationship building.

TYPE OF EVENTS



EVENT
GLOBAL GOSH GATHERINGS

FORMAT
3-4 days

BEST FOR...
Community building, defining collective strategy and action, increasing movement visibility

---

EVENT
REGIONAL OR TOPICAL GOSH GATHERINGS

FORMAT
3-4 days

BEST FOR...
Advancing specific aspects of the roadmap, increasing visibility, networking, building community

---

EVENT
RESIDENCIES

FORMAT
3-4 weeks

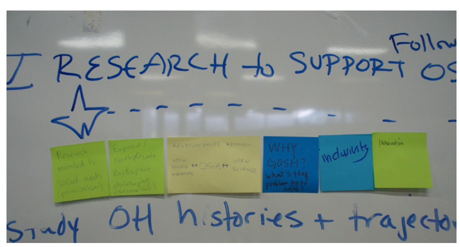
BEST FOR...
Peer to peer learning, building local capacity, community building, advancing specific hardware projects



EVENT
HACKATHONS

FORMAT
1-2 days

BEST FOR...
Attracting attention at the local community level, sparking new communities with hands-on work, generating ideas on specific topics



EVENT
WRITING WORKSHOPS

FORMAT
3h sessions

BEST FOR...
Producing a concrete output (policy, documentation, translations, etc), engaging non-GOSH participants

Images: GOSH 2017 Gathering, held in Santiago de Chile (top right). AfricaOSH working session (top left). Post it notes from a session during the 2017 Gathering in Santiago (bottom).

TIP

We'll get to this further along in the GOSH model documentation, but an organiser checklist is an essential tool, no matter which type of event you have in mind!

GOSH GLOBAL EVENTS

GOSH global gatherings happen every 1-2 years and bring together active users, developers, enablers and thinkers in open science hardware worldwide who are or have the potential to be key contributors to advancing open science hardware in their own networks and communities.

The goals of global GOSH include:

- building community among very diverse actors in open science hardware;
- acting as a barometer for the health of the community;
- discussing and documenting challenges, opportunities and achievements of the community;
- bringing forward community initiatives such as the GOSH Roadmap;
- raising awareness of open science hardware in a particular region;
- bringing the concept of open hardware to the public.

GOSH global events have a particular format reflecting all of these purposes and more, where people gather during four days in which hands-on workshops are combined with facilitated discussion in both small group and plenary sessions. Public events are held and there are also cultural and social opportunities.

"There's a sense of urgency on what we are doing. A big challenge is how to keep focused on the goal of the Roadmap, making open science hardware ubiquitous by 2025. We have to really move the needle on the agenda. How we communicate our events, and how we documentate them, is key for impact. How to get the maximum radiation and influence out of a single event?"

FRANÇOIS GREY

GOSH REGIONAL AND TOPICAL EVENTS

These events typically have similar goals to the global GOSH gathering, but are aimed at a subset of the community: to raise the work that has been done and needs to be done in those geographic areas, disciplines or sectors.

They are usually shorter (1-3 days) but use similar session formats to global GOSH with talks, discussion groups and hands-on sessions. Some topical events may be even shorter and are run as discussion-oriented workshops to address a particular topic. One example of this is the **GOSH policy workshop series**[14] run in 2021, addressing technology transfer offices, funders and international policy makers. These workshops took the form of two hour online meetings or a series of salon style discussions.

RESIDENCIES

These are collaborative events usually intended to advance the development of particular hardware, although the format could also be applied to another project with very specific goals and deliverables (e.g. educational materials, a policy briefing).

Groups come together in-person over three weeks or more, although shorter versions could be envisaged along with hybrid online/in-person models. In the case of the hardware residencies, the agenda is a combination of peer-to-peer learning sessions, free time to work on the prototypes and open days to work and discuss with the public.

> *"We want the residency to reflect and address issues specific to the context of each country. In Peru, we proposed working on biomedicine, diagnostic tools and low-cost equipment for public health centres that lacked equipment, with open science hardware projects that are flexible, modifiable and scalable."*
>
> **PIERRE PADILLA**



Greg Austic adjusts unconference schedule timings at the 2018 GOSH Gathering in Shenzhen.

WHEN IS THE EVENT HAPPENING? PLANNING YOUR TIMELINE

Depending on the type of event you are organising, the timeline may vary. However, we have identified three best practices for helping define when the event should happen:

THINK LOCALLY

Based on the location you have chosen for hosting the event, consider the factors that may favor one time of the year over others. For instance, you may consider if there are particular weather events (rain, hurricanes, fires) or holidays that may make a certain time of year unsuitable. If you are running a global or regional event, what is the availability of the local partner? Will they have the capacity to support the event in full before, during and after or are there extenuating circumstances — another conference, a regional holiday — that will make this difficult?

BUILD A TIMELINE BACKWARD

This will help you to create deadlines and make sure that you have enough time for each of the activities that go into planning an event. For instance, if your event is November 1, plan to have travel reservations booked by September 15, which means that you should confirm attendance to participants by July 1. If going international, at least three months should be allowed for visa applications.

LOOK AT WHAT OTHER EVENTS ARE HAPPENING

Before deciding on a date, check around to see if there are other events happening on similar dates that may attract a similar audience, meaning you'll have lower than expected attendance. For example, the **OSHWA Summit**[15], another GOSH event, or a **MakerFaire**[16]. Consider seasons as well. Will you get as many participants as you're hoping for during holidays or seasons where people typically go on vacation? Are there local events happening in the same city that will make travel costs more expensive than normal?

Working backwards from the point at which the budget is closed for a particular event and all travel reimbursements are completed, we suggest the timelines on the subsequent pages.

GOSH GLOBAL GATHERINGS

Anticipate a minimum of a 12 month cycle, with fundraising starting from 18 months before the next event. As an example, you can find below a timeline that was used for previous GOSH global events.

12-18 months in advance FUNDRAISING FOR EVENT

December 1
GOSH GLOBAL ORGANIZERS GROUP HAS FIRST MEETING

December 1 - January 1
REVIEW OF UPCOMING GOSH

Organizers look at locations, potential venues, dates, local partners, accommodations, etc.

January 15-March 15
ORGANIZER PLANNING PERIOD

Organizers meet to get basic logistics in place that will be necessary for people before they apply: location, dates, budget, general outline of program, if there is funding available, etc.

Important: communicate dates to people as soon as they are confirmed!

March 15 - April 15
APPLICATION PERIOD
People are welcome to submit applications to GOSH

April 15 - May 1
APPLICATION ORGANIZATION
Applications are organized for reviewer

May 1 - June 1
APPLICATION REVIEW PERIOD
Community review of applications

June 15 [earlier is better]
ATTENDEE NOTIFICATION
People are notified about coming to GOSH.

During June
ORGANIZERS SECURE HOUSING BLOCK
More info in the logistics sections

July 1
CALL FOR EVENT VOLUNTEERS: DOCUMENTATION, EVENING ACTIVITIES, ETC
Refer to the organizing team section for more info

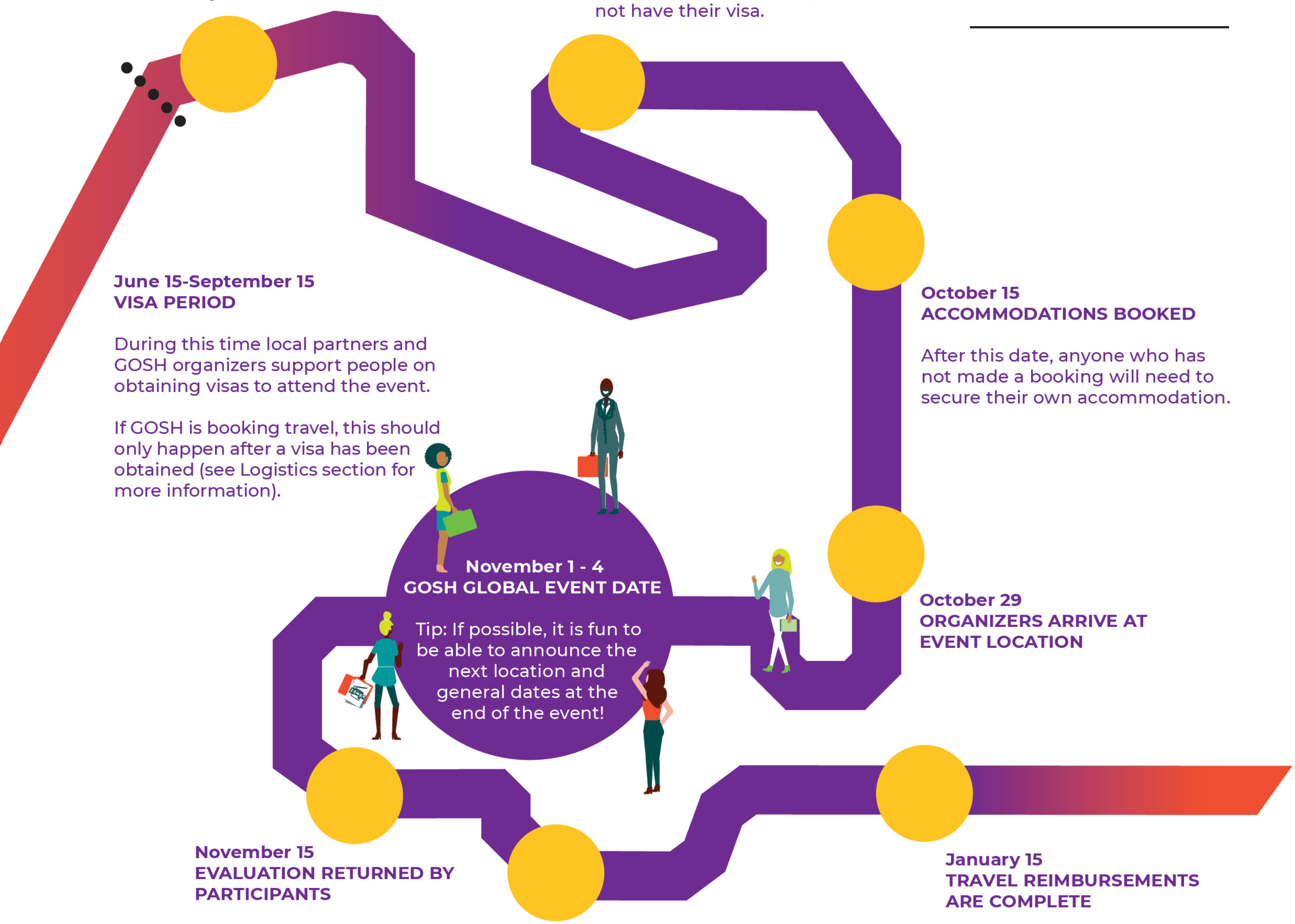
July 1
ATTENDEES ACKNOWLEDGE THAT THEY PLAN TO ATTEND GOSH.

IF ATTENDEE IS ELIGIBLE FOR TRAVEL SUPPORT FROM GOSH, THEY ACKNOWLEDGE IF THEY WILL ACCEPT IT

Participants who are receiving funds should make any request to have GOSH pre-purchase their travel ahead of time.

NOTE

The previous GOSH events have had capped attendance numbers, some of the steps in this diagram may need revision if future events are not capped.



June 15-September 15
VISA PERIOD

During this time local partners and GOSH organizers support people on obtaining visas to attend the event.

If GOSH is booking travel, this should only happen after a visa has been obtained (see Logistics section for more information).

September 15
VISAS RECEIVED

If GOSH is supporting an attendee, they should have their visa in hand by this date.

October 1
TRAVEL BOOKED

After this date, anyone who has not made a booking will need to secure their own travel arrangements.

Anyone expecting reimbursement from GOSH should book fully refundable tickets if they still do not have their visa.

October 15
ACCOMMODATIONS BOOKED

After this date, anyone who has not made a booking will need to secure their own accommodation.

October 29
ORGANIZERS ARRIVE AT EVENT LOCATION

November 1 - 4
GOSH GLOBAL EVENT DATE

Tip: If possible, it is fun to be able to announce the next location and general dates at the end of the event!

November 15
EVALUATION RETURNED BY PARTICIPANTS

Afterwards, GOSH community coordinator drafts an evaluation report and shares on the GOSH forum.

December 1
REQUESTS FOR TRAVEL REIMBURSEMENT ARE DUE

January 15
TRAVEL REIMBURSEMENTS ARE COMPLETE

This is done in coordination with GOSH, Inc or other organisations where funds are held.

REGIONAL/TOPICAL GOSH

Anticipate a minimum of an 8 month cycle, with fundraising starting from 12 months before the next event. As an example, you can find below a timeline that could be used as inspiration for GOSH regional or topical events.

12-18 months in advance
FUNDRAISING FOR EVENT

April 1
ORGANIZERS GROUP HAS FIRST MEETING

April 1-June 15
ORGANIZER PLANNING PERIOD

Organizers meet to get basic logistics in place that will be necessary for people before they apply: location, dates, budget, who will manage the funds, general outline of the program, if there is funding available, etc.

June 15 - July 15
APPLICATION PERIOD: VARIES BY EACH EVENT

August 1
ATTENDEE NOTIFICATION

People are notified about coming to your event.

August 15
ATTENDEES ACKNOWLEDGE THAT THEY PLAN TO ATTEND YOUR EVENT

IF ATTENDEE IS ELIGIBLE FOR TRAVEL SUPPORT, THEY ACKNOWLEDGE IF THEY WILL ACCEPT IT

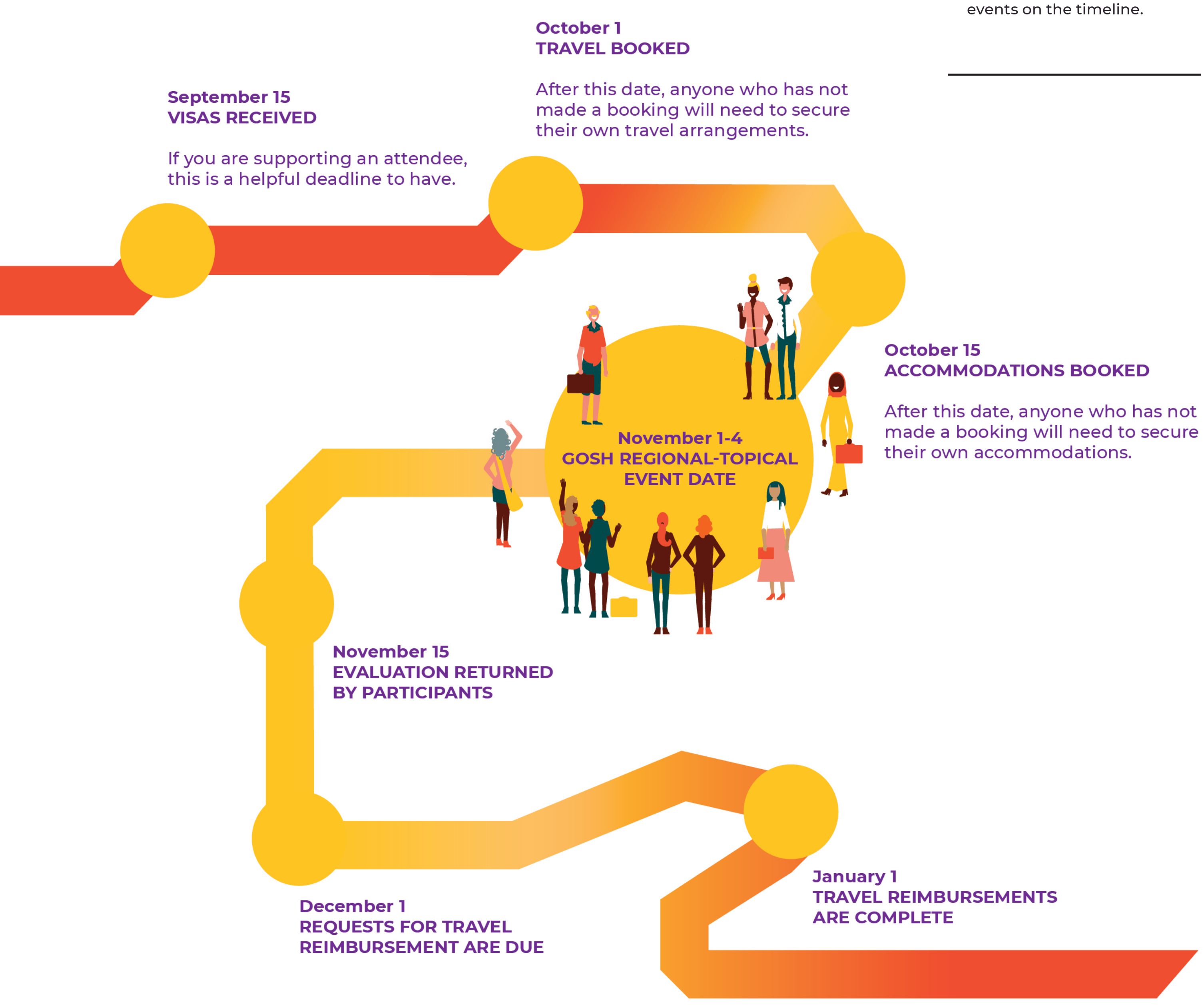
Participants who are receiving funds should make any request to have event organizers pre-purchase their travel ahead of time

August 15-September 15
VISA PERIOD

During this time event organizers support people on obtaining visas

NOTE

Regional and topical GOSH events have had varying application and review models which might change some of the key events on the timeline.



GOSH DEMOCRATISES SCIENCE

WHERE IS IT HAPPENING? CHOOSING A VENUE

GOSH is committed to ensuring a space where everyone from the community can feel safe, and that will be accessible for people to visit.

It is critical to have strong local partners and a supporting institution or organisation to manage local logistics and visas for international travellers. This should be a priority in planning your event location. Once you have identified a location, working with the local organisers to secure a venue is one of the first things you have to do in order to be able to plan your event. The space determines much more than how many people you can fit: it has major implications for programming and logistics as well.

CRITERIA FOR CHOOSING LOCATIONS AND VENUES

WHEN DECIDING A COUNTRY

- Is there a strong local partner who can commit significant time to join the core organising team?
- How difficult is it to obtain visas for attendees? Are some countries discriminated against in ways that will make it complicated to attend? Does the country have embassies in most other countries? Note that if not, participants may need to fly internationally in order to get their visa.
- Is the country safe to visit for LGBTQ+ communities, women, people of color, etc.? Are there laws that would make this an actively unsafe location for the event to be hosted in?
- Are there other laws (such as laws that restrict the activities of foreign NGOs) that complicate hosting an event in this location?
- How well connected is the country in terms of air travel and what are the flight times from different parts of the world? For example, Australia and New Zealand involve long flights from almost everywhere.
- How expensive is the country in terms of accommodation and living expenses?

> *"In Shenzhen we could just stay there until midnight if we wanted to. In Open Hardware from Academia, in Bath, it was a normal conference center where when your time is up people ask you to please leave. We were very lucky in China that we could just stay whenever and do whatever we wanted."*
>
> **JULIAN STIRLING**

WHEN DECIDING ON A CITY/LOCATION WITHIN THE COUNTRY

- Is there a suitable venue? (see more details below)
- Are there event housing and venue options in close proximity?
- How easy is the city to reach from major airports?
- Is there good public transport or plentiful safe ways to get around?
- Are there any specific safety concerns e.g. areas that frequently see protests?
- Is it easy for foreigners to travel around and communicate?

WHEN DECIDING ON A VENUE

- Is there room for workshops or hands-on activities?
- How configurable is the main space? Is it a fixed seating lecture theatre or are all chairs movable?
- What type of technical set up is there? Is there a projector? Are there lots of electric outlets? Is wifi openly available (and strong enough for many users)? You may need to make arrangements to boost both electricity access and WiFi if not.
- Are lab activities allowed?
- Is there room for breakout sessions? How many and of what size? Are larger rooms suitable to host multiple sessions without problems with volume?
- What kinds of insurance and at what amount does the venue require?

- Are there limited hours of access? If the venue is only open 9-5, consider places where participants can hang out together with their hardware in the evenings. We have found that being able to stay late and play with hardware makes for happy GOSHers.
- Can organisers access the venue themselves or is a key holder required? Can participants get in themselves?
- Does the venue require you to use their catering services? Is there space for the group to eat together or would they need to share a communal dining hall? Is there space for participants to prepare their own drinks/food?

THINKING OF ACCESSIBILITY AND INCLUSION

- Is the venue accessible for people in a wheelchair?
- Does it have enough room to set up space for parents to be with their babies?
- Is it possible for anyone, besides participants, to access it or do you need a key/card to enter?
- Is it far away from the city, or well-connected?
- Will it allow non-gendered restroom signage (if this isn't already at the venue)?

ITINERANT EVENTS

GOSH global events and regional events usually move around, because a core goal is to bring open science hardware to new audiences and strengthen regional communities. If your event does not have this goal and you have found a great venue then we recommend staying in one place because it drastically reduces the planning burden. You know the venue and can reuse much more material and information from previous years.

If it is important to move around, you can use the aftermath of each event to seek out future locations. In the **GOSH global evaluation forms**[17], a couple of important questions are asked: "where should GOSH go next" and "are you interested in being a local partner". During event wrap-up, organisers typically look at the list of recommendations and create a shortlist of 3-5 countries.

Other regional/continent events, such as AfricaOSH, have similarly used a model to ensure that the event moves to different regions across the continent. For global events we also think holistically about where previous events have been held to ensure we don't over commit to one region (especially US or Europe). Once there is a shortlist, the GOSH organisers spend significant time doing research and speaking with GOSH participants from the country to think about the potential options.



Schedule for 2018 Gathering in Shenzhen.

"In China [...] we don't usually have the experience of meeting people from so many countries and backgrounds [...] Shenzhen is a key city for hardware, and we had connections with maker spaces, hardware ecosystems, open hardware projects and the Shenzhen Open Innovation Lab. GOSH organisers were looking for a venue and they found it perfect."

JI LI

WHO IS ORGANISING?

Having the right number and mix of people on your organising committee is key to event success, so consider carefully how many people will be required and how to organise them.

Some general points to consider for any event are:

- Ensure that the combined availability of the organisers is sufficient to get the job done, particularly as they will typically be volunteers. Be upfront about expectations, time commitment and any benefits for the committee members.

- If you have an opportunity to get administrative support from an organisation or institution, this is usually very helpful. For instance, all previous GOSH global events have been provided the event venue free of charge.

- The organising committee should reflect the diversity you are aiming for in the event.

Having a wide team of volunteers from the local community and making them available for press interviews or media appearances, is a good way to showcase that a GOSH event is a collective effort, instead of concentrating attention only on organisers.

Next we dive into a detailed guide on how GOSH global events are organised from a team's perspective. Regional and local events can reduce this model, picking up only the applicable elements.

"We had a steering committee and a big team of volunteers to organise Africa GOSH, and also a local committee from the host country. We used to share the documentation on how the event should look like in a shared folder, so everybody could add input. During the event, we all implemented the housekeeping rules"

THOMAS MBOA

GOSH GLOBAL GATHERINGS: ORGANISING MODEL FOR LARGE EVENTS

CORE ORGANISING TEAM

The GOSH global organising team is the core organising unit that builds the event, runs the event and does the wrap up. It is important to have this team in place before other decisions are made. This team is responsible for key logistics and program design, though at any point a larger group of people can be called in to support on things such as providing feedback on the programme, organising specific parts of the programming (such as planning a public event or a social night), documentation at the event, evaluation afterwards, ensuring venue accessibility, etc.

For GOSH global events, we recommend a core team of 5-7 people. This size has worked well in the past, as it is large enough to distribute responsibilities and small enough that it allows the team to progress at a more rapid pace.

We've found that it is helpful to have a mix of previous and new organisers. Having people who have organised previous events allows for continuity and transfer of knowledge, while first time organisers allow for new ideas to refresh the event. Remember that GOSH organisers work as volunteers, so make sure they have enough time to contribute and be prepared to switch people around or bring in extra support if needed.

The work can be broken down into key areas:

LOGISTICS

Previously two people have been overseeing all logistics for the event as this is a major task and often requires rapid responses and action. Within that logistics team or via delegation to another team member, it is important that a clear "owner" is identified as early as possible for critical logistical activities such as catering, visas, housing, etc.

PROGRAMMING

The program team typically is 3+ people and they are responsible for designing the program, inviting speakers (if required), connecting with local partners for technical needs such as wifi, projectors, lab space, etc.

LOCAL PARTNERS

The GOSH organising team also includes local partners. There are typically 3-5 people available who can help with planning related to the venue, accommodations and obtaining visas. It is incredibly important when hosting an international event that the local partner has support from an institution for providing visa letters for GOSH attendees.

FUNDRAISING AND SPONSORSHIP

Leading on writing grant applications, sending emails to potential sponsors, organising sponsorship tiers and keeping in communication with event supporters.

COMMUNICATIONS

Setting up a website, flyer or poster, social media for publicising the event and working with the rest of the core team to ensure that applicants and attendees have the information that they need e.g. the event information booklet.

SELECTING PARTICIPANTS

This will involve the whole team and often additional reviewers from the community but someone should be responsible for setting out the template spreadsheet for scoring applicants, arranging meetings to discuss selection and logging acceptances so that those on the waiting list can be invited.

FACILITATING THE EVENT

Each session will need a facilitator, this does not have to be a member of the core team and community members can be brought on board to help but it is usually easier if the core plenary sessions, unconference planning and opening/closing sessions are facilitated by a core team member and/or a trained and experienced facilitator.

SAFETY OFFICER + CODE OF CONDUCT COMMITTEE

While each event has had a different model, in order to uphold the **GOSH Code of Conduct**[18], there should typically be:

SAFETY OFFICER

Designated ahead of time, this should be someone who is available during the whole event and is identified at the beginning of the event as someone who people should go to if they have questions about the Code of Conduct or if they experience a breach of the Code of Conduct.

The safety officer can also be assigned work beyond the code of conduct:

- ensuring that the venue is accessible for all participants wherever possible, e.g. accommodating any participants with disabilities, or access to non-gendered bathrooms;
- being the focal point for participants to approach for troubleshooting various issues or signposting to the best member of the event team to help.

CODE OF CONDUCT COMMITTEE

This group supports the safety officer, and can both be proactively alert for conduct issues (e.g. participants repeatedly interrupting others, any form of harassing behavior) and also help discuss and make decisions about how to proceed if any issues arise.

2-3 people should be sufficient for this purpose and we do not recommend including all members of the committee. Code of conduct reports can be highly sensitive, the fewest people necessary should have access to them.

> *"(In Santiago) We had people who looked out for the Code of Conduct and that's all they did, they didn't multitask. If there was an issue, you could talk to them or send them something anonymously and they would just take care of it. And that can't be someone who is also running the meeting."*
>
> **MAX LIBOIRON**

EVENT COMMITTEES

In order to cover all areas, tasks can be divided into working groups, especially ones that support immediately before, during and after the event. This typically requires less time commitment either in absolute hours, or the length of commitment compared to the core team who work on the event for the whole 12 month planning cycle.

It's also a good way of getting community members involved and can act as on-boarding for future core team members. Core organisers can also get involved with committees and working groups and usually each smaller group will have a point person within the core team.

Previously small committees have come together around a number of topics:

- Documentation: gathering photos, videos, notes during the event and dealing with social media posts, blog posts and the community report.
- Accessibility: ensuring that the venue and the programming takes into account accessibility and inclusivity for all participants.
- Public engagement: organising public show and tell events, science fairs or other formats. This includes enrolling participants to exhibit, working with local partners on publicity, facilitating the event.
- Social and cultural event planning: organising fun activities for GOSH participants to socialise, get exposed to local culture and share their own talents and culture.

> *"In 2017, all the press requests came to me, and there were another eight people [organising], I didn't want that role. It would be great to designate a group to deal with the press, put together some stories to give to the journalists, and build bridges."*
>
> **FERNÁN FEDERICI**

FISCAL SPONSORSHIP/ORGANISATIONAL SUPPORT

For any event with funding, an organisation with a bank account to receive funds and the ability to sign contracts will be needed. Since 2020 GOSH global events have the support of the US-based non-profit GOSH, Inc. for booking travel, acquiring event insurance, and other matters related to fundraising and finance. Regional events have typically partnered with a local nonprofit or university to support the event and usually a member of the core organising team has been affiliated with that organisation.

You also need an organisation to provide visa letters to GOSH attendees and should work with them on understanding the different types of visas available and documentation required. For example, some countries require the inviting organisation to apply for approval first, before issuing the invitation letter. Our experience has been that it is difficult for smaller nonprofits to issue successful visa letters, and that having a larger institution issue visa letters is necessary. The above roles do not necessarily need to be the same organisation and in previous GOSH events the visa issuer and fiscal sponsor have been different organisations in different countries.

As an organising committee, make sure that your chosen organisation is fully aware of your expectations including the commitment of their staff time, how quickly you might need them to respond and any other matters that could affect how smoothly the event organisation goes. For example, it is critical that payments and visa invitations are sorted on time.



Photo of a hallway at the 2018 GOSH Gathering in Shenzhen, hosted by Open FIESTA at Tsinghua University.

WHY IS IT HAPPENING? CONNECTING TO THE GOSH ROADMAP

GOSH is an open and inclusive community where members are encouraged to self-organise and use the community to amplify their work. If you would like to use the GOSH branding for your event, please consider:



THE HISTORY OF GOSH[19] AND THE BROADER GOALS THAT THE COMMUNITY HAS OUTLINED IN THE GOSH MANIFESTO.

If your goals, values and ability to use key community guidelines such as a Code of Conduct, do not align with GOSH, we request that you do not use the GOSH brand.



THAT GOSH EVENTS SINCE 2018 ARE GUIDED BY OUR COMMUNITY ROADMAP[20] THE GOAL OF THE ROADMAP IS THAT OPEN SCIENCE HARDWARE BECOMES UBIQUITOUS BY 2025.

The GOSH roadmap proposes three areas to work on: LEARN, SUPPORT and GROW. How can your community event contribute to advancing these?

> *"Three months before GOSH 2018, I started talking in the GOSH forum about the workshop I was planning to do [...] So when we arrived in Shenzhen, people already knew about it and we could work together. To organise an event, I'll start spreading the word as soon as possible."*
>
> **FERNANDO CASTRO**

The GOSH Community Council will work to seat a global GOSH organisers group each year. If you are organising a GOSH regional or topical event, make sure you communicate to the global community that you are organising a GOSH event. You can do so by posting your event to the forum.

Communicating your event to the global community is important for many reasons. It allows the global community to understand how the movement is growing, grants people the opportunity to express interest in attending, and it helps onboard newcomers. It is also important for you, as you will be able to improve your event's outreach, generate new connections and level-up the overall result by learning from other people's contributions.

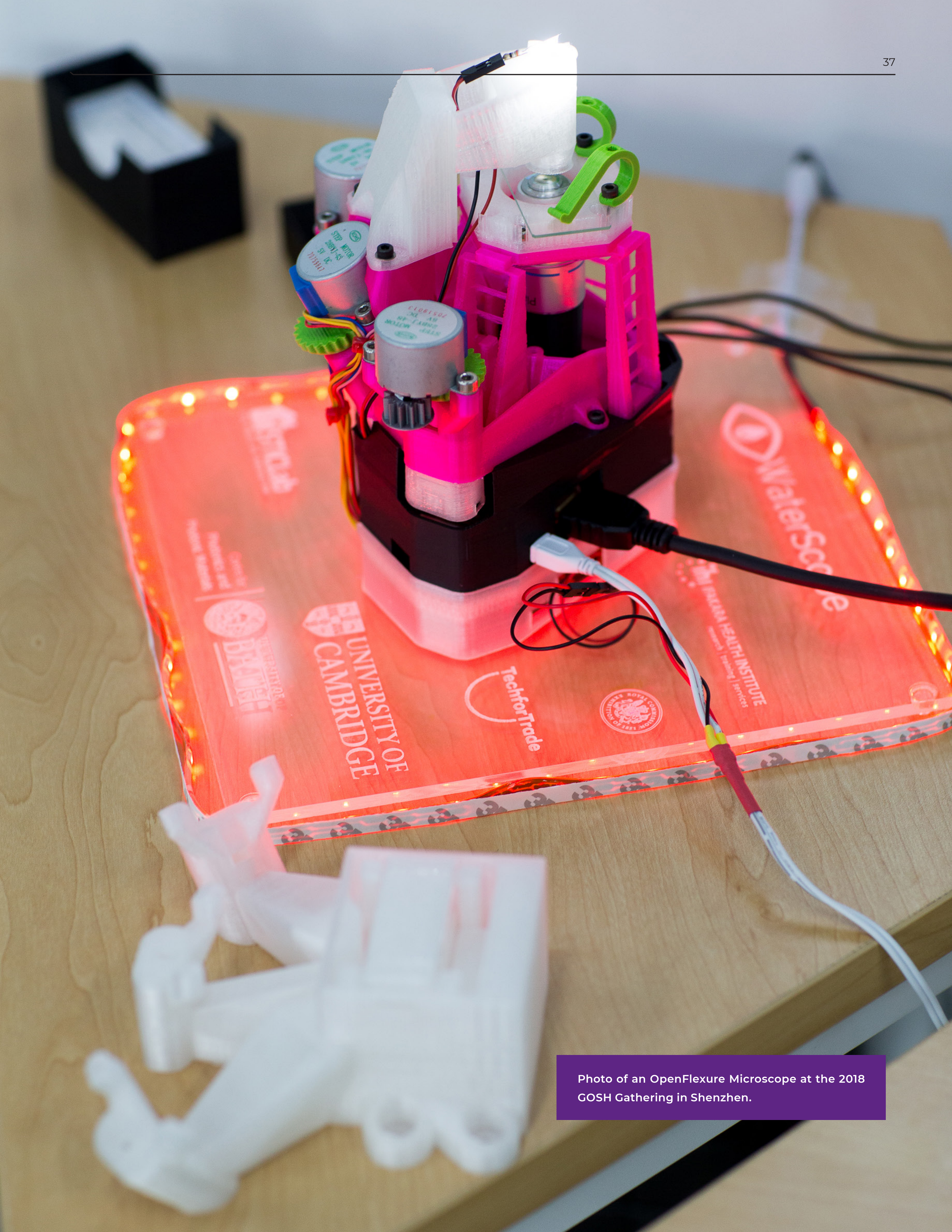


Photo of an OpenFlexure Microscope at the 2018 GOSH Gathering in Shenzhen.

GOSH HAS NO HIGH PRIESTS

PLANNING THE AGENDA

GOSH events usually follow the rule of 70/30: 70% of the agenda is defined by participants using an unconference format; 30% of the content is defined by the organisers. This proportion can vary, but make sure you leave a significant part of the agenda to be defined by participants.

Session and Activity
The 101: code of conduct, facilitation training, history of gosh, cultural and/ or institutional acknowledgements and welcomes

Best for: Kick off your event in a way that allows everybody to be on the same page

Session and Activity
Predefined sessions

Best for: Advance specific elements of the roadmap related to your community

Session and Activity
Unconference sessions

Best for: Understanding the needs of your community and engaging participants, giving space both for newcomers and long-standing members of the community

Session and Activity
Workshops

Best for: Learning new techniques, advancing ongoing projects

Session and Activity
Posters

Best for: Building connections between participants, showcasing ongoing work

Session and Activity
Public events

Best for: Communication and engagement strategy, growing your community

Session and Activity
Call to action

Best for: Contribute to GOSH Roadmap, keep momentum going after the event

Session and Activity
Pre-GOSH evenings and side activities

Best for: Community building, advancing specific projects through live collaboration, socialising and having fun!

As you will be expecting input from participants, it is a good idea to **anticipate as much of that input virtually**. Topics and sessions for discussion can be pre-identified, once participants are confirmed, using the GOSH forum before the event. This will give people time to think about sessions and get a feeling of what will be discussed during the event. In the case of workshops, these need to be planned beforehand, as you will need to calculate costs and provide the necessary materials. You can use the forum as a platform for participants to share workshop proposals, and open a "sign up" option so you can calculate attendance.

Time is always limited, and there is going to be some **trade-off between time allocated to discussion-based sessions and time dedicated to workshops**. Early preparation for the workshops, working directly with workshop facilitators so everything is ready before the event kicks off, can help them avoid missing out on other activities due to preparations. Another useful strategy is to set the agenda so all hands-on activities are grouped and people miss as little as possible on discussion-based sessions. If there are discussions that are important to move community work forward, try not to schedule them at the same time as workshops that you know are going to be popular. However, make sure there is some balance in activities so it doesn't become tiresome for participants.

If this is not the first edition of your event, another element to consider is the **different needs of participants** that have already been part of previous editions, versus needs of newcomers. You want newcomers to have the opportunity to meet the community, engage with hardware workshops and learn about the work GOSH has been doing, so they can contribute to the GOSH roadmap. But you also want experienced GOSHers to be able to push ongoing conversations forward, or to work on specific ongoing hardware projects. Make sure your agenda contains activities that can provide benefits for both groups.

This leads us to an important aspect: when planning the agenda, **you should take into account the overall arc of the event.** The goal is to try to keep participants engaged, and the energy up as different activities unroll. In line with past GOSH events' agendas, we recommend you start with more structured activities, so people understand the context and how the event works. As participants get to know each other more, the activities and overall feeling of the event will become more relaxed. This is why leaving trips and public events towards the end is convenient, it will also give people sufficient planning time. And most important: do not plan sessions early in the morning after a group dinner or party!

> *"When we put out the application for Great Lakes GOSH and posted it in the forum [in 2019], we just got a really diverse group of people applying. I'm sure that it was a lot more work in the earlier GOSH events, but now you start out with this diverse community. We got a really interesting mix of people right off the bat."*
>
> **RYAN FOBEL**

EXAMPLE SCHEDULE FROM GOSH 2017

WEDNESDAY, MARCH 22ND 2017		
09:45 - 10:00	Location introductions	
10:00 - 10:20	GOSH history, background, intro to CoC	
10:20 - 11:40	Speed meeting	
11:40- 13:30	Lunch and setting up of posters	
13:30 - 15:00	Lunch break	
15:00 - 15:15	Open poster session and tables	
15:15 - 15:35	Anacleto Angelini Innovation Centre and UC welcome GOSH movement introduction	
15:35 - 15:45	Launch of community-run Journal of Open Hardware	
15:45 - 16:45	Short Stories of OSH	Max Liboiron - Open Science Hardware for Equity
		Jorge Appiah - Open Science Hardware: A tool for Agrica's Innovation and Development
		Andrew Thaler - Open Source for an Open Ocean
		Rafael Pezzi - Collaborative tools for open hardware development community
		Xiamyra Daal - BioHack Academy
16:45 - 17:15	Open discussion and Q&A	
20:30 - 00:00	Reception at The Clinic/Bar Radicales	

THURSDAY, MARCH 23RD 2017					
	Unconference Space A	Unconference Space B	Unconference Space C	Unconference Space D	Unconference Space E
10:30 - 11:30	Design	Biology, Life Sciences, Microfluidics	Collaborative development	OSH tools enabling education	
11:30 - 12:30	Inclusivity	Performative and Interactive Art	Open Source in Developing Countries	Philosophy practice	Agriculture and environmental data collection
12:30 - 13:30	Lunch Break				
13:30 - 15:00	Promote teaching of Open Source Hardware	Visionary science speculative fiction	Lowtech	Upscaling	Policies, legal and more
15:00 - 15:15	Coffee break				
15:15 - 15:35	Citizen Science	Documentation	Business Models	Standards	
15:35 - 15:45	Dinner at The Clinic/Bar Radicales				

FRIDAY, MARCH 24TH 2017				
	Unconference Space A	Unconference Space B	Unconference Space C	Unconference Space D
9:30 - 11:00	Documentation and publication workshop with Tobey	Design skills with Maria	Make an OSH business plan with Greg and Tara	Discussing Anti Capitalist OSH
11:15 - 12:45	Contextualizing OSH: lessons from the Global South with Thomas	Mixed signal PCB design with Joel	OSH for citizen science. Defining citizen science, resources, ethics, values and networks.	“Workshopology”: sharing workshop models with Juanma.
12:45 - 14:15	Lunch Break			
14:15 - 15:00	GOSH roadmap: introduction and definition of core values of community			
15:00 - 15:45	GOSH roadmap: add more ideas and post-its to the different areas			
15:45 - 16:15	GOSH roadmap: prioritize the objectives and ideas			
16:15 - 17:00	GOSH roadmap: questions, answers, discussions			

SATURDAY, MARCH 25TH 2017					
	Unconference Space A	Unconference Space B	Unconference Space C	Unconference Space D	Unconference Space E
09:30 - 12:30	Build your own waterscope microscope with Richard		DIY CAD. Draw circuit boards, and soldering with Marc	Feminist meetup	
11:30 - 12:30	Lunch Break				
13:30 - 15:00	Hands-on DocuBricks documentation with Tobey	Politics in technology with Jeff	Identify a project to collaborate on with Greg	Python for science	
15:00 - 16:30	Applying for funding, with Bethan	Design skills with Maria	OSH curriculum building with Andrew	How to make human powered aircraft with Shingo	Fix it together with Ellen
Extra afternoon parallel sessions	GOSH documentation team working session				
	Latin-American GOSH meetup				
	Write a legal two-pager about GOSH				

GOSH IS ETHICAL

CODE OF CONDUCT

Reviewing the Code of Conduct should be one of the first things you do after the general welcome and meeting kick-off. While all participants have agreed to it during the application period, don't assume that they have read it in full or even if they have, remember all the components. Before the event, review the Code of Conduct and make any updates necessary based on your event.

To introduce the Code of Conduct, here are key pieces to go through:

- The Code of Conduct is taken seriously. This is not just a "because we have to have it" document. Serious Code violations will result in consequences.

- Identify your safety officer (who can also be the one who does the Code intro) and/or Code of Conduct committee. Clearly identify how you can get in contact with the appropriate people. Having a clear way to identify that person(s) throughout the event is helpful.

- We are from a lot of different cultural backgrounds. There are some things in the Code that might not make sense and you should strive to create an environment where this can be discussed. Identify the safety officer and/or Conduct Committee as people who individuals can privately speak with to understand things that might be confusing.

- Go through the Code of Conduct section by section. Provide examples of potential violations and examples of what people can expect in the case of a potential violation, but also provide examples of positive behavior that counters your negative examples.

There is the possibility that there will be clear and direct violations of the Code of Conduct that require immediate action. Most likely though, there will be instances where it is required for the safety officer and/or Code of Conduct Committee to individually speak with the person potentially violating the Code and discuss why an action might have been interpreted in the way it was by someone else. GOSH global events have had people from 30+ countries and while we are creating spaces that everyone feels safe and welcome to participate in, we also have to be aware that Codes of Conduct are historically built around Western ideologies of correct behavior and that different cultures potentially have other interpretations. Being ready for conversations with people to talk through things is important.

GOSH EMPOWERS PEOPLE

EMPOWERING PARTICIPANTS

We recommend kicking-off your event by sharing with participants the broader context in which it is embedded. What is the goal of the event, and how does it connect to the global movement? You can do this at the very beginning, and complement it by quickly going over **the history of GOSH**[21].

Previous kickoff talks have included:

- **Max Liboiron** – Open Science Hardware for Equity
- **Jorge Appiah** – Open Science Hardware: A tool for Africa's innovation and Development
- **Andrew Thaler** – Open Source for an Open Ocean
- **Rafael Pezzi** – Collaborative tools for open hardware development community
- **Xiamyra Daal** – BioHack Academy

On the first day of GOSH global, before you move into breakout sessions, we always do a group **facilitation training**[22]. Depending on the size of the space, this has taken on a couple of different formats:

- Full group training where one person introduces facilitation techniques and a couple other "volunteers" (who are worked with ahead of time) demonstrate them in action, or
- 4-5 facilitation trainers each take a small group and model facilitation techniques.

We have found that small group sessions and even individual interactions benefit from everyone having a basic sense of how to navigate conversations, ensure there is room and time for everyone to participate and understand how to help others navigate tricky moments.

We recommend having these guidelines (or an abbreviated version) posted on the walls in the spaces where you'll be meeting and having printed page versions so people can refer back to them.

> *"[During GOSH 2017] We tried to move the culture away from leadership towards facilitation: how to get people to put everyone's ideas on the table and invest in other people, instead of investing in themselves, in their own good idea, like individualism culture. So there's techniques to anti-oppressive facilitation, as the AORTA collective guidelines[23]. We made four or five guidelines and put them up everywhere, and we did training."*
>
> **MAX LIBOIRON**

PREDEFINED SESSIONS

The predefined sessions can be organised in different ways. One way to start thinking of it is to make a list of interesting topics that are part of the GOSH roadmap and that are particularly interesting for your community. Then brainstorm names of potential speakers with the organisers' team.

Another way to present it is to think of the program as a mini-version of the roadmap, creating three axes: learn, support and grow. Identify how your community can relate to those three aspects, and plan sessions accordingly. If you already have a communication channel open with your community (we recommend it) you can ask people what they would like to work on during the event.

In terms of formats, in our experience horizontal, panel-like conversational sessions tend to work better than keynote speakers with presentations. It allows you to bring multiple perspectives into the same topic and spark discussion afterwards, involving participants in the conversation.



Xiamyra Daal introduces BioHack Academy during the kickoff talks at the 2017 GOSH Gathering in Chile

UNCONFERENCE SESSIONS

If participants will be defining the agenda during the event instead of doing it virtually (check "planning the agenda" section), you have to make sure all of them understand how the unconference format works and its goal. Someone from the organisers team has to explain the basics. There are many intricacies to facilitation styles for unconferences and we recommend that at least one person on the core organising team familiarises themselves with and recommends the event facilitation style:

- Event organisers create a large board to be used during the event. Draw or print a big schedule of your event with big empty slots left for the unconference sessions. You will use it as part of the unconference sessions' planning, and it will become the meeting point for people to check what is going to happen and where. One recommendation: make it BIG.

- During the event, participants write down their ideas on notecards and put them on a board. One way to do this is to provide large post-it notes and markers to participants. Invite anyone who wants to propose a topic to headline it on a post-it. Once everyone is ready, each person will read out their topic to the whole group, and hand the post to the facilitator(s), who will put it on a wall or whiteboard.

- The facilitator works with participants to merge similar ideas and create sessions. The facilitator(s) may combine topics that are similar (with the express agreement of the proponents). This also helps if there are more proposed topics than spaces. Once the agenda has been created, the facilitator will announce the beginning of the unconference time.

- The facilitator assigns a space and time for each session on the board. People can choose which session to attend, and don't have to excuse themselves for leaving a session or roaming around.

- At the beginning of each session, one facilitator and one documentarian should be assigned.

Note that in setting the unconference agenda it is important to balance specific in-depth topics where conversations can be progressed in the space of an unconference session and high-level, clustered topics where the unconference session will allow an update, brainstorming, knowledge sharing or networking to occur. An unconference

> *"This vibe needs the right level of structure: enough flexibility that people can make their own niches and activities and conversations happen organically, but enough structure that everybody feels empowered and comfortable to self-organise. At global GOSH the first day is more structured, the second is tightly timetabled, the third is more flexible, and typically the fourth is into the community. Finding the right balance is key to keep the vibe going so that people can engage at their own level."*
>
> **Jenny Molloy**

session on "Open hardware documentation tools" might end up emerging from the suggestions "Best practices for building a bill of materials", "Ways to encourage continuous documentation during hardware development" and "Embedding quality assurance in documentation", the resulting session may not end up answering any of the original questions. If you end up with all sessions being very generic and high-level topics, this is likely to be frustrating for long-standing members of the community as introductory material will be covered and the conversation may not reach new ground; on the other hand, a programme full of very specific and deep conversations is not inclusive for newcomers to GOSH. Try to retain a balance. Although these tactics have not been tried at a previous GOSH, some things you could try include:

- Hosting some "Open Hardware Essentials" sessions that allow newcomers to get up to speed with broader topics like open hardware documentation. Ensure these sessions include a number of longer standing community members, maintain a conversational unconference format and are spaced out enough not to cause a feeling that newcomers and longer-standing GOSH community members are in separate tracks.

- For those deeper or more niche conversations that may not fit into the unconference agenda, allow proposers to invite others to talk to them about it over lunch or dinner or at the end of the day - you could even have table signs so people can find the group.

The **Aspiration facilitation wiki** [24] has useful resources where you can find further information on **facilitation techniques**[25], **unconference planning**[26] and **running participatory events**[27].

> *"The funny thing about an unconference is it actually requires a lot more work than a normal conference. Don't think an unconference means you show up and everything happens magically. Actually, you need to be quite specific. There's a process there of identifying interests, then merging the interests into topic areas and then creating sessions out of that. The process itself actually has value in everybody understanding what everybody else actually wants."*
>
> **GREG AUSTIC**

OTHER TYPES OF SESSIONS

OPEN POSTERS AND EXHIBITION BOOTH

Participants usually have projects they want to showcase and let others try.

It is also possible that in a more academic setting, people may want to present their work in a poster format.

Make sure there's some space, even if it is a couple of tables with access to power, or a hallway covered in white paper, where people can show their work. Assign some time in the agenda for people to visit the stands; you can also promote it as an activity during the breaks.

PUBLIC EVENTS

Another component of the predefined agenda is the public event and the connection with local artists. The goal here is to understand and experience that GOSH gatherings are situated, contextualised events. What makes a GOSH event in Peru different to one in Ghana?

Organising a public event can be as complex or as simple as you want it to be. In its more complex form you can partner with a public institution or company to showcase hardware projects. You can also go with participants to a community, school or other public space to share what you do. In its simplest form, you can set up an expo in the event venue and announce beforehand that your event has an "open day", where anyone can visit and have a conversation with your community.

EVENINGS

As part of enabling the low-pressure socialising and community atmosphere we want to foster, you can identify places nearby where people can go and have dinner together, maybe play with hardware and also play music. You will probably want to book those places or come to an arrangement with the owners beforehand to get discounts.

> *"The practical hands-on workshops are extremely fruitful as a safe little zone where people do something with their hands and sit next to each other for a couple of hours; it's kind of an icebreaker, a playground for interaction. Some people feel comfortable if they have something in their hands, and they don't feel so comfortable if they're in a circle where they have to voice out an opinion."*
>
> **MARC DUSSEILLER**

PRE-GOSH & SIDE ACTIVITIES

In the past, GOSHers who arrived at the event location a couple of days before the official event decided to organise "preGOSH" activities. These included, for example, sprints for advancing specific hardware projects, or visits to local hackerspaces. Offline gatherings give a unique opportunity for international open hardware collaborators to come together and advance a project in an informal setting. You can facilitate the means to plan these pre-activities by using the GOSH forum, and finding out if the event venue is accessible for people to meet there before the event.



Huaqiangbei Market by Urs Gaudenz, taken during 2018 GOSH Gathering in Shenzhen

> *"Familiarity always helps to make things easier. [At AfricaOSH] we like to have a meal together sometimes outside where we are staying, somewhere nice. We have parties almost every evening during the event. Having these social activities as part of the summit also makes things easier, more interesting and improves the overall experience."*
>
> **GAMELI ADZAHO**



Experimenting with open hardware 8Bit Mixtape synthesizer amongst open science hardware at the 2018 GOSH Gathering in Shenzhen

GOSH IS IMPACTFUL TOOLS

ENDING THE EVENT: A CALL TO ACTION

In-person events are instances where people connect in a different, more powerful way than virtually. We seize that opportunity to propose, at every event, a call to action to advance the GOSH roadmap.

According to the needs of your community, your call to action can take different forms. Do projects need more visibility? Do you need to translate or produce communication materials in your own language? Do you want to start a periodic meet up? Previous calls to action at GOSH include publishing and signing the **GOSH Manifesto**[28] (2016), writing the **GOSH roadmap**[29] in a collaborative way (2017), and creating **GOSH working groups**[30] for advancing specific roadmap aspects (2018).

Make sure you allocate enough time for the call to action alongside the unconference sessions. During GOSH events, it usually takes place at the end. The trigger is to ask the question "what do we need to do, in order to move [your community goal] forward?".

A first brainstorming exercise together is important to make sure everyone is onboard and you are not working on a call to action that people can't relate to. Once the *what to do* is defined, you can move on to the second part: asking people to choose items they want to work on and self-assign responsibilities.

Make sure there is a mechanism to follow-up on the activities: are there any deadlines? Will the organisers systematise the information and share the results with participants later on? As an example, all actions from GOSH 2018 were translated into GitLab issues and assigned to participants. Some GOSHers were in charge of following up, and later on a bot was created for that task.

> *"Defining together, during the event, how to advance some of the work that is identified as necessary once the event is over. That keeps it moving during the year, it's not 'yet another conference'. There is a direction that was collectively agreed on, and each regional or topical community contributes to that vision from their own place."*
>
> **JULIETA ARANCIO**

MAKING IT FUN

GOSH events are fun. People may be discussing how to revolutionise science, or working on a new tool for biohacking, but the atmosphere is always collaborative and relaxed. Having hardware that people can touch, changing activities' formats so you are not seated all the time, eating and if possible cooking together, all contribute to generating that atmosphere.

One activity that has worked well for getting people to talk in all previous GOSH events is the Speed Meeting. We use it as an icebreaker, after the opening and before moving on to defining the unconference agenda. Attendees are told to form a circle,

in pairs. They have to talk to the person next to them for two minutes, after which the "inner" partners rotate and talk to the new participant, until everyone has chatted at least 2 minutes with each other. An organiser keeps time and announces when to change partners.

It is important that as long as it respects the Code of Conduct, discussion and disagreement are allowed to emerge between participants. One of the things that GOSH attendees appreciate is that at GOSH real discussion takes place. You will also find that some people will just want to stay for hours working together on one thing. It's OK. Your goal is to facilitate a low-pressure, socialising atmosphere.

In past events we have also organised some quirky activities to come together by the end of the gathering, while everyone is still in the venue. In GOSH 2016 people were using the double-decker bus at CERN IdeaSquare to run sessions, and playing around with the photo booth. By the end of GOSH 2018 there was some dancing time inside the event venue, and a wall full of funny pictures and memories from the event that attracted everyone's comments and attention. Planning a simple, fun activity to wrap the event helps you to build a sense of community, and makes it easier to keep the momentum going online.

CLOSING ACKNOWLEDGEMENTS

At the end of each event, one of the organisers should provide acknowledgements. This is a great way to acknowledge acts — large and seemingly small — that people have undertaken throughout the event.

Though this can take many forms, previous GOSH organisers have thanked participants (including calling out specific acts by individuals), sponsors, the local organising team, core organising team and working group members, people that run the event venue, catering, etc. It's always nice to say thanks, particularly if there's something specifically memorable to highlight: e.g. to a venue employee who always has a fresh pot of coffee available, or a participant who led a spontaneous stretching session late in the day when everyone started getting tired.

If you're the person doing closing acknowledgements, keep a notebook to record the thanks you want to give and anticipate spending at least 15 minutes doing so. There will be applause and other appreciation from participants to be sure!

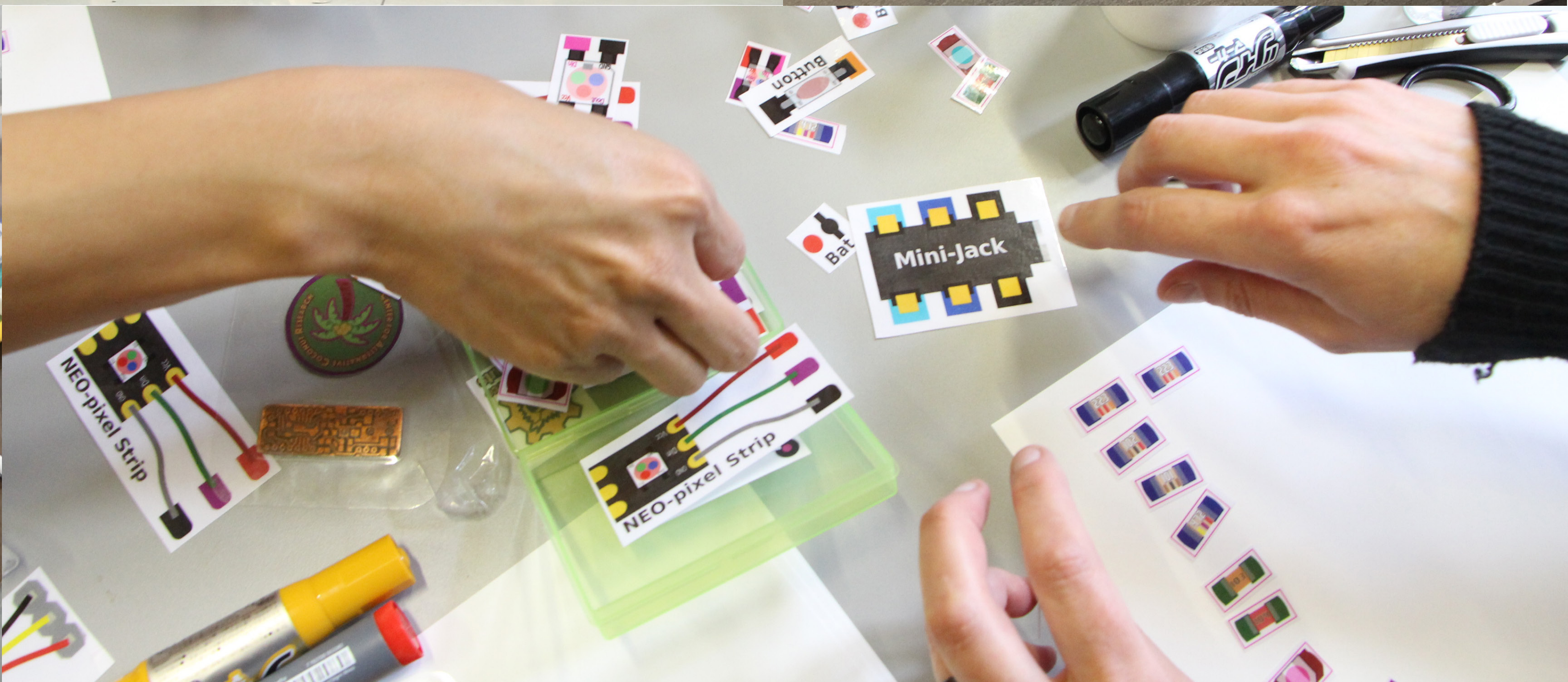


Images (clockwise): Palok Biswas making buttons at a community event after the 2018 GOSH Gathering in Shenzhen. Double-decker bus at CERN IdeaSquare, where the 2016 GOSH Gathering took place. Group photo from the 2018 GOSH Gathering in Shenzhen. Making music at the 2018 GOSH Gathering in Shenzhen. Participants working on a project together at the 2017 GOSH Gathering in Santiago


GOSH! 2016
Gathering for Open Science Hardware
MARCH 2-5th, 2016
CERN IDEASQUARE, GENEVA
LONDON TRANSPORT
ALDWYCH






Mini-Jack
NEO-pixel Strip
NEO-pixel Strip
Button
Bat

PLANNING COMMUNICATIONS

The goal of planning communications is that your event gets enough attention so people in your community want to apply to it, and that you can ensure participants have all the necessary information they need in time, with as little work as possible.

These are the minimum communication pieces that you will have to prepare and send out according to your event's timeline:

PROMOTION & OPENING APPLICATIONS

Your goal here is to spread the message as far and wide as possible among and beyond the organisers' and GOSH community networks. Announce your event in the GOSH forum, so it can be transmitted through GOSH social media channels.

Prepare a standard piece of text and/or flyer that you can easily disseminate by email, in forums, and even in print (e.g. to pin to community or university boards). Graphic materials that you produce in this stage, like flyers, can also be reused later for social media.

Your communication materials should ideally link to your event's landing page or directly to the application form. The application form is one of the most important materials you have for your event. It has to collect the minimum information to allow you to select participants according to GOSH community criteria. Not only to meet the demographic goals but also to capture what people expect of the event, and their interests.

To make things easier, you can check the **GOSH 2018 application form template**[31].

GOSH 2018: DEMOGRAPHIC GOALS

We include demographics because we want to make GOSH as equitable and representative of the movement as possible. What do we mean by equitable? Check out this **visual reference**[32] to equality vs. equity.

To this end, the demographic goals of GOSH 2018 were (overlaps are possible):

- Women, Trans or gender non-conforming: 52% of attendees
- People of color, Indigenous people, and people from low income countries or/ and communities in Africa, South and Central America and Asia: 52% of attendees
- People from Asia: 33% of attendees
- Unaffiliated, community-based organization/NGO: 33% of attendees

For more information, see the "selecting participants" section.

EMAILS TO PARTICIPANTS

You will be communicating first with applicants and then with selected participants. Avoid sending too many emails, or you risk people not reading them.

In order to better plan your communications, you can use the **GOSH email templates**[33] that contain the minimum communications you will use. These include:

AFTER APPLICATION IS SUBMITTED

"Thanks for your application" message (automate this from the application form)

REGARDING ACCEPTANCE AND TRAVEL

You've been accepted[34] + ask for confirmation of attendance

You've been accepted and we are assessing your application for travel support[35]. Here's what you need to do next...

- Yes, you have been awarded travel funding[36].
- No, we cannot provide travel funding[37], here are your options

Sorry not this time, here's other ways you can continue interacting with the GOSH community[38]

BEFORE THE EVENT

Event FAQs should be updated on an ongoing basis and there will be various reminders about travel funding, accommodation, visa invitation letters, etc (try not to spam people, though)

Reminder close to the event + participant welcome package

AFTER THE EVENT

Thank you for participating + feedback survey + next steps on travel reimbursement

NOTE 1

The requirement to agree to the GOSH Code of Conduct should be requested and confirmed twice during this process: during the application submission, and when people are accepted to GOSH they should be reminded that they agreed to the Code of Conduct during application submission.

NOTE 2

These are the demographic goals GOSH global has previously used. Some regional/topical events are open invitation and if attendance caps are lifted at future GOSH global events, these formats will need to be revisited.

COMMUNICATION WITH ALL PARTICIPANTS AHEAD OF THE EVENT

One of the most important things we've learned over the years, is that it is very important to send as much information as possible prior to the event.

Below are some of the things that people will either expect or that we've learned from experience are essential pieces of information. Here is an example of **FAQs made for GOSH 2018**[39] and a **Survival Guide for Shenzhen**[40] (you can also access the **Survival Guide for Shenzhen editable version**[41]).

CONTACT INFORMATION

If something happens during travel, upon arrival, during the event, attendees need to know who to contact and what to expect when they contact that person/group of people.

MAPS

Even if you're in a big city and digital maps are readily available, we've found that it's very helpful for attendees to receive maps and clear instructions on getting to and from essential places (airport, venue, housing, restaurant for group dinner, etc).

AGENDA

Though part of the GOSH agenda will be built in person during the event, provide as much information ahead of time. Though GOSH events are an intensive time together, everyone needs to know when they can take a break and it's especially important for parents who have childcare responsibilities during the event or community members who need regular breaks to eat, take medication, or attend to other personal needs.

FOOD

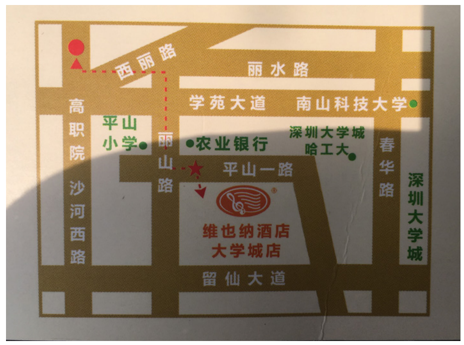
Please see the detailed information earlier in this document, but it is important for people with food preferences, needs and/or allergies to understand the availability and type of food well ahead of time so they can make other plans if necessary.

TRAVEL INFORMATION

If you book housing or air travel for people, make sure that they have the confirmation numbers and any other relevant information in hand. If air travel is booked for them, it is best to make sure they have the person who booked the ticket available on WhatApp during their actual travel e.g. for global GOSH this would be someone from GOSH, Inc.

REIMBURSEMENT PROCESS

If people will be receiving a travel reimbursement, they should be sent 1) the reimbursement form, 2) clear instructions on what is eligible for reimbursement, and 3) a note that they must hold onto all receipts for costs they will be reimbursed for. For GOSH global, this information can be obtained from the GOSH, Inc. administrative team.



MONEY AND CELLULAR

Arriving in a new country and realising your debit/ATM card doesn't work and that you don't have cash to be exchanged is pretty terrible. Likewise, for many people travelling outside of their own country for the first time, realising they cannot rely on a mapping app or have access to cellular service, is a shock. Here's some tips:

- In the welcome package, recommend that everyone bring at least $20 in cash in case their debit cards do not work on arrival.
- Provide information for the airport: where are the closest ATM machines to the airport exit? Where should people have cash exchanged if needed? Provide similar information for around the event venue and housing.
- Though you do not need to provide instructions for every type of cell phone, clearly note if you anticipate people will not be able to access cellular service on arrival. You can also point to a location at the airport and one around the event venue and/or housing where they can purchase local SIM cards and details any restrictions on obtaining them as a foreigner.



Images: Map to help participants find their way in Shenzhen (Top) and signage from the GOSH panel session at Shenzhen Maker Week which coincided with the 2018 GOSH Gathering.

EMAILS TO SPEAKERS

If you are planning to have speakers, you will also have to plan communications ahead of time, ensuring they get at least the following information:

- How much time they have to present,
- The format: if it is a panel or there will be Q&A afterwards,
- Available resources: screen, mic, board… Is there any particular need?
- Is the event recorded or not?
- Is the speaker being paid for their participation?

Check out this twitter thread on **good practices for communicating with potential speakers.**[42]

EMAILS TO WORKSHOP ORGANISERS

If you are planning to have hands-on workshops, you will need the following information from session organisers:

- How much room do they need?
- How many plug sockets will be required?
- Are there any special space requirements? e.g. must take place in a biology lab
- Are there any risks associated with the activity? For workshops involving biology, chemistry, hot soldering irons or other hazards, a lightweight risk assessment should be completed so attendees can be warned of any dangers before they start and steps can be put in place to avoid injury. Examples of risk assessments can be found for different kinds of settings and activities, including workshops: **Generic Mechanical Workshop risk assessment**[43], **Guidance for risk assessment in Workshops**[44], and a **Generic Risk Assessment.**[45]
- How many people can participate?

- Will items need to be shipped ahead of time or will they fetch everything? If shipping, are there special requirements e.g. cold storage?
- Do they need peripherals like keyboard, monitors, mice?
- How much time do they need either side of their session to set up and clear away?
- Do they need any presentation tools: flip charts/projectors etc?

Be very clear about the facilities available and send photos so that organisers can decide if the session will work or not.

EMAILS TO SPONSORS

If your event has sponsors or you want to ask people for sponsorship, you might want to prepare dedicated materials for them. Take a look at the **GOSH 2018 Sponsorship material.**[46]

Keep in touch with your sponsors in the run up to and after the event - make sure to shout out to them during sessions and on social media.

SOCIAL MEDIA

Social media can be useful to amplify your message. A good way to plan messages ahead of time is to schedule them using tools like **Tweetdeck.**[47] Make sure that sufficient members of the documentation team have access to the Twitter account and other social media to tweet updates and images throughout the event. Ideally have a social media rotation system: the person assigned to publish content rotates, so you get diverse perspectives and the burden is distributed evenly.

Think of a hashtag for your event and include it in all communications you send to participants, so they can post messages to it and you can later use it as part of the event documentation. Try to keep it simple, in the past we used #GOSH2018, #GLgosh2019, #reGOSH. Make sure you tag @GOSHCommunity!

GOSH CHANGES THE CULTURE OF SCIENCE

SELECTING PARTICIPANTS

Participant selection is one of the most important tasks when planning a GOSH event. We recommend you accept at least one third more applications than the number of participants you can host. There is always a percentage of people that apply and confirm, but later on can't make it to the event due to unexpected situations. For instance this means that if your goal is to have ~100 attendees to select 130 people to attend.

GOSH global events have previously capped attendance numbers, as a means for doing deep-dives into building the community in the first several years. There have been recommendations from the community to note for future organisers that the cap on participants is potentially raised or removed in light of the dynamic growth of open hardware for science over the last several years.

Regional and topical events all have different ways of managing applications and attendees but the GOSH global model is described below for those who might adopt or adapt it.

SELECTING PARTICIPANTS FOR GOSH GLOBAL EVENTS

Once the application period is closed, we recommend you organise all the information in a spreadsheet to start the selection process. You can get inspiration from the **GOSH global events participants selection spreadsheet**[48].

1. Divide the total number of applications between the organisers, trying to have at least two organisers review each application once. This is also a part of the process where you can ask several additional members of the broader GOSH community to participate. If you do this, make sure to provide clear guidelines for how the review is being done (see **GOSH guidelines for application reviewers**[49]).

2. Give organisers a deadline for reviewing their batch of applications and assign each of them one of these three options: YES, NO, MAYBE. In this step you want to identify those applications that are incomplete or do not meet the minimum requirements.

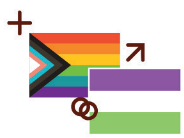
3. Meet after the deadline and review the applications tagged as "NO". Decide if you change any of them to YES or MAYBE. To note, in the past these conversations have taken between 3-5 hours, so make sure to calendar enough time.

> *"At [global] GOSH I tried to talk about the body as open source hardware. The idea of the laboratory of the commons is for me more important than the piece of hardware that is made there [...] the network of affective connections between the material, the personal, the physical, the tangible and the intangible that create an entity that has its own presence."*
>
> **PAULA PIN**

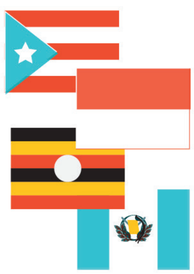
4. From now on, keep working only with the YES and MAYBE applications, considering the following selection criteria, a combination of demographic goals and interests/background of participants:

The demographic goals listed above are for the GOSH global event. Other GOSH regional or topical events should have similar benchmarks, but they will most likely be different based on your audience.

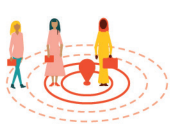
DEMOGRAPHIC GOALS



52% WOMEN,TRANS OR GENDER NON-CONFORMING



52% PEOPLE OF COLOR, INDIGENOUS PEOPLE, AND PEOPLE FROM LOW INCOME COUNTRIES OR/AND COMMUNITIES IN AFRICA, SOUTH AND CENTRAL AMERICA AND ASIA



33% PEOPLE FROM THE REGION THE EVENT WILL BE HELD IN



33% UNAFFILIATED, COMMUNITY-BASED ORGANIZATION/NGO

However, one criteria that will always apply is that GOSH aims to support in particular the people who usually can't attend these kinds of events. Some examples include independent artists or researchers without affiliation, mothers who do not have access to childcare providers, people who can't afford travelling, paying for accommodation or an entrance fee.

SELECTION CRITERIA

This event is for people working in all different forms of science, from citizen and community science to academic research and industrial R&D to biohacking.

We're looking for people who are

- actively engaged in open hardware for science as developers, users, inventors, tinkerers and thinkers
- who can contribute to growing the community and movement.

We will select a combination that will best represent the diversity of projects in the OScH movement and its international nature.

5. Are you low on any of the demographic goals? Dedicate time to reach out individually to potential participants that could apply to your event.

We know this is hard work. Open hardware, like many other communities in STEM, has a diversity problem. However, diversity of participants is what all GOSH past attendees have identified as what makes GOSH special. Don't give up! Ask for help in the forum if you are running out of ideas.

6. The reviewing team will also be required to make decisions on travel stipends based on the available budget. Please see the travel section of this document for information on how this is done.

While it is nice to be able to offer the same amount to many people, please be aware that not fully covering the costs of travel for some potential attendees will make it impossible for them to attend. During previous GOSH global events we've prioritized ensuring full payment for those who require it and then providing partial travel support for others.



Attendees pose for a picture before the GOSH panel session at Shenzhen Maker Week 2018.





Images: Answering questions from the public on open science hardware during the GOSH panel session at Shenzhen Maker Week 2018 (top). Attendee at Shenzhen Maker Week 2018 asks a question during the GOSH panel event (bottom).



Images: Dorcas Adhiambo Owinoh during hands-on workshops at the 2018 GOSH Gathering in Shenzhen (this page). Unconference Session at the 2018 Gosh Gathering in Shenzhen (right).

CHAPTER 02

DURING THE EVENT



SETTING UP AND RUNNING THE EVENT LOGISTICS

One of the most important things that organisers and other volunteers can do during the GOSH event is be consistently welcoming and ready to assist. Organisers should arrive at least two days in advance of the event, if possible. No question is too small! To kick this off, you'll need to set up a sign-in table at the main entrance to the event.

At the table, here's the essentials:



NAMETAGS

Design and print ahead of time, including:

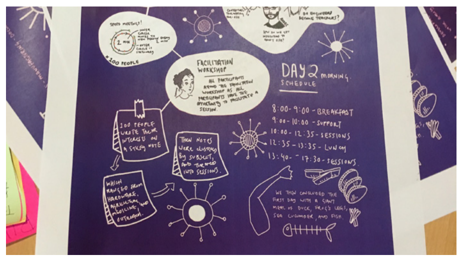
Name (as the person would like to be called)

Optional: affiliation, "ask me about", etc.

Pronouns. To note: the request for the use of pronouns on name tags are not normalised worldwide. At past GOSH events, we've used a **pronouns sign**[50] at the nametag table to explain what pronouns are and why we ask people to identify them at GOSH global events. Additional conversations and explanation of pronouns to some attendees should be expected and welcomed.

Stickers. GOSH global uses stickers or other types of bright and clear identification to note who is an organiser and/or who is volunteering on different committees.

Tips: People typically prefer lanyards over pins. Have extra blank name tags available. Inevitably someone will lose their nametag or not have one correctly printed out.



PRINTED AGENDAS

Many people won't have cell access at least on the first day until they get sorted. Print large agendas that can be hung on the way near registration and have a stack that can be handed out to people if they need them as they arrive.

MEDIA STATEMENT

There are many ways to create media statements for events and we recommend that you think about your own needs and craft a statement that fits them. However, it is important that you at least have a media statement so people know if you're videotaping, photographing, how and where images will be used, how to request not to be included, etc. At past GOSH events, we've used **a media consent sign**[51] at the nametag table. Some events will use specific opt-in forms, others will build media permissions into the event registration and acceptance and operate an opt-out policy.

LIABILITY WAIVERS

GOSH global attendees will need to sign a liability waiver. We strongly recommend that all regional/topical events require the same.

CHECKLIST OF ATTENDEES

Have a printed out list of names that you can mark as people arrive. After the first day, if people haven't arrived, organisers typically reach out to them to see if they're still planning on attending, having travel or visa issues or need support in any other way.

CODE OF CONDUCT

The Code of Conduct should be posted on the wall throughout the venue, but also have copies available in smaller print format for people to take with them and read.

A "GOODIES" TABLE

Attendees will bring stickers, flyers, brochures, pins, you name it. Have a table ready and point them to it when they ask.



Name tags and agendas from the 2018 GOSH Gathering in Shenzhen (left). Stickers from the "goodies" table at the 2018 GOSH Gathering in Shenzhen (above).

CHECKLIST OF ESSENTIAL MATERIALS TO HAVE ON HAND

SIGNAGE & POSTERS

- Posters (GOSH 2018 Posters Example[52])
- Roller banner (GOSH 2018 roller banner Example[53])
- Large banner for wall (GOSH 2018 large banner Example[54] - note that this is an Affinity Design file)
- Signs or flipcharts — done ahead of time and paper for making them at the event. It's great to establish a relationship with the venue printing office ahead of time in case you need quick signage. Flipcharts templates from GOSH 2018.[55]

TECHNOLOGY

- Projector and computer
- Microphone and sound system
- Lots of extension cables and international plug adapters

STATIONERY

- Markers
- Whiteboards or easels with big pads of paper
- Post-it notes
- Stickers
- Materials for extra nametags
- Sticky putty
- Tape (regular and colored for creating the agenda)
- Glue
- Pins for corkboard
- Massive paper for making the GOSH agenda

COMMUNICATIONS DURING THE EVENT

During the event, communicating over the forum or social media are not the best ways to get event specific and logistical information to attendees.

We recommend setting up a chat system that is locally available and that participants can add themselves into. For instance, AfricaOSH uses WhatsApp for event and community organising; during GOSH Shenzhen, WeChat was used. There are other options like Slack that will help get rapid communication out to attendees.

Make sure that participants can set themselves up on these systems - have a friendly community member on hand to offer technical support. Keep reminding people to check in throughout the event.

> *"Try to interact with people that you wouldn't normally feel inclined to interact with, to avoid our bias. You have to be prepared to listen to things in a different way and try to understand what they are saying, not only listen to think about an answer. This is the real interaction, this is how you find surprising ideas."*
>
> **ANDRÉ MAIA CHAGAS**

GOSH HAS NO BLACK BOXES

LIVE DOCUMENTATION

Documenting your event openly online serves different functions. It allows participants to see what happened during the event, which is particularly important if you are running simultaneous sessions. It is also useful for those who couldn't make it to the event, and through documentation can learn how to connect with your community. Finally, it allows you to keep track of activities and themes that emerge when your community is together, as a tool for reflection and guidance of collective action.

For bigger events, you can ask participants beforehand if they would like to volunteer in a dedicated documentation team. For smaller events, as long as people document the unconference sessions and someone in the organising team documents the general ones, you should be covered. Make sure you show appreciation for those who document!

You can also do live tweeting/other social media of your event. You can have one organiser in charge of social media, or you can ensure everyone in the organiser's team can access the accounts, to make it a more diverse experience.

Live documentation includes notes that can be posted, e.g. to the GOSH forum, but also audiovisual materials. Always ask, before taking pictures or recording, if people are OK with it.

Check the **GOSH 2018 session documentation template**.[56] Notes usually include three sections: participants, notes, action items. If you post the notes in the forum you can expect people to keep discussing the topic after the event.

COMMUNITY REPORTS

It's very important that GOSH, like open hardware, is documented really well! Not everyone will be able to attend the event so it's important to make as much material available as possible. The more documentation you can get completed at or just after the event the better, before people return to their "real lives".

As mentioned during the planning sections, at GOSH global events every session is assigned a note taker to document it as a forum post, and the documentation team follows up at the end of each day to chase up unfinished session notes. Documentation comes in a variety of formats:

- Session notes - usually shared on the GOSH forum and/or gitlab
- Pictures - usually uploaded to the **GOSH Flickr**[57] account (make sure people appearing in pictures have given their consent via the event media statement!)
- Videos - shared via youtube
- Slides - shared via Open Access repositories such as **Zenodo**[58]

Once the event is over, the documentation team will start compiling these sources into a single document, called the "community report". Community reports usually start with a summary of the event, the details of the organising and documentation teams, list of sponsors, participants and schedule. The main section is a compilation of all sessions' summaries for each day and links to complete notes, including workshops, poster sessions, description of public events, pre-gosh and side events if any. The report also details the guidelines that apply to the event, such as the code of conduct, and the media consent. Pictures are used to illustrate community moments, and social media channels and hashtags are also listed.

These are the **GOSH 2017 community report**[59] and **GOSH 2018 community report.**[60]

The community report is an important tool that condenses everything that happened during the event from the perspective of different members in the community. It can be used by participants to recap on sessions they attended, or check those they were not able to attend; by newcomers to understand what happened during a previous event; by the organising team as evidence of work and by the community as a whole to reflect on the consensus, discussions and work to be done in the future.

> *"Documentation is key, because it means access to information. We have to build a consensus on the importance of leaving a record for whoever comes next, and a commitment to dedicate a specific space and time for this every day of the event."*
>
> **LAURA OLALDE**



Images: Session during the 2018 GOSH Gathering in Shenzhen (this page). Bird Nest Pollution Sensor built during a workshop at the 2018 GOSH Gathering in Shenzhen (right).

CHAPTER 02

AFTER THE EVENT



CERTIFICATES

Many participants from academia will need an attendance certificate to justify their attendance at the event, you can offer these on request or make one for everyone. Check the **GOSH 2018 certificate of attendance template.**[61]



Attendees during a work session at the 2018 GOSH Gathering in Shenzhen.

GOSH HAS NO BLACK BOXES

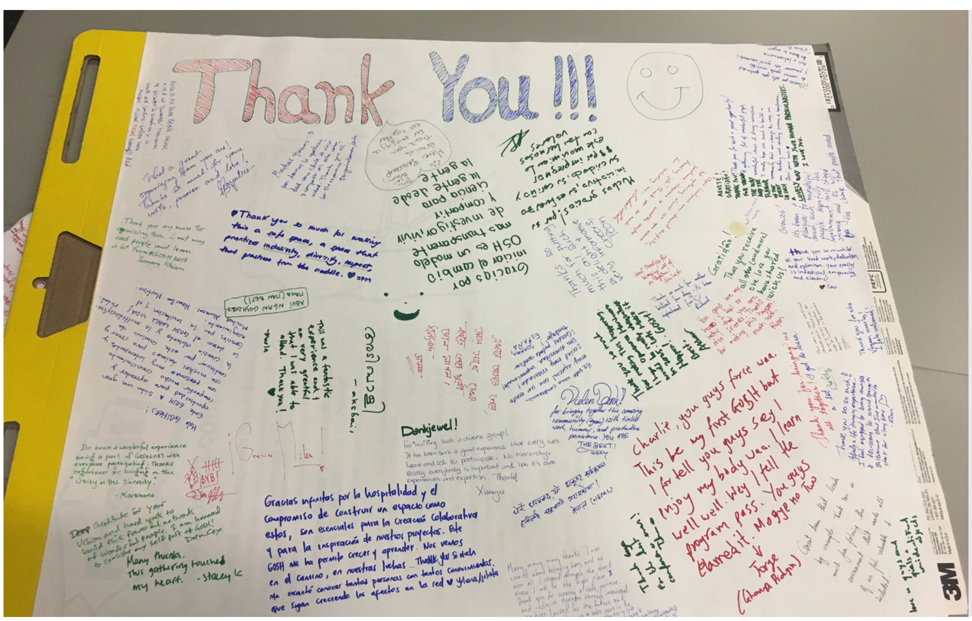
FEEDBACK FROM PARTICIPANTS

Once your event is over, you will want to reflect what was achieved, and learn from attendees about their experience. During GOSH global, we typically hand out evaluation forms on the last day of the event and provide a place where people can drop them and then also send a digital survey afterwards.

Previous surveys have been invaluable in directing future GOSH activities and events. We use a longer format to capture all of the constructive feedback people have to offer. The surveys are shared amongst the GOSH global organisers in raw format and then they are summarised and shared with the whole community on the forum.

Once your evaluation period is complete, the GOSH Community Coordinator takes the raw results and compiles a summary. Aim to have the period from evaluation close date to the date the summary is reported out, be no more than 1-2 months.

Check the **feedback form template**[62] that was used for GOSH 2018 and for GOSH 2017.



Poster filled with thank you messages from the 2017 GOSH Gathering in Santiago.





Soldering open science hardware during a hands-on workshop at the 2018 GOSH Gathering in Shenzhen (top). Juan Pedro Maestre holding up the GOSH roadmap at the 2018 GOSH Gathering in Shenzhen (bottom).

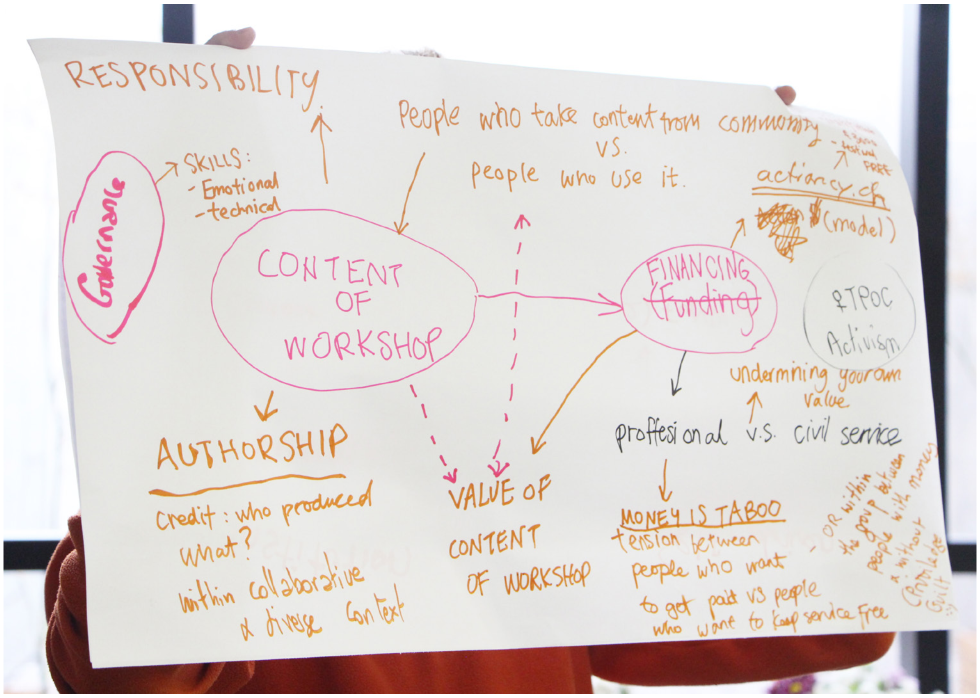
FUNDER AND SPONSOR REPORTS

Often sponsors are happy to receive the community report, but many funders with formal granting programmes will have a particular deadline and format for their reports, including financial reporting.

Make sure you understand the requirements and plan time to write the report and to gather the necessary information. The main contact point with the funder in the organising team should be liaising before, during and after the event with:

- the documentation team, to ensure that the necessary information is collected,
- any organisations handling payments, to collect the financial information.

Here is an **example of a report**[63] prepared for the Alfred P. Sloan Foundation about GOSH 2018, that can be used as a starting point for your own report.



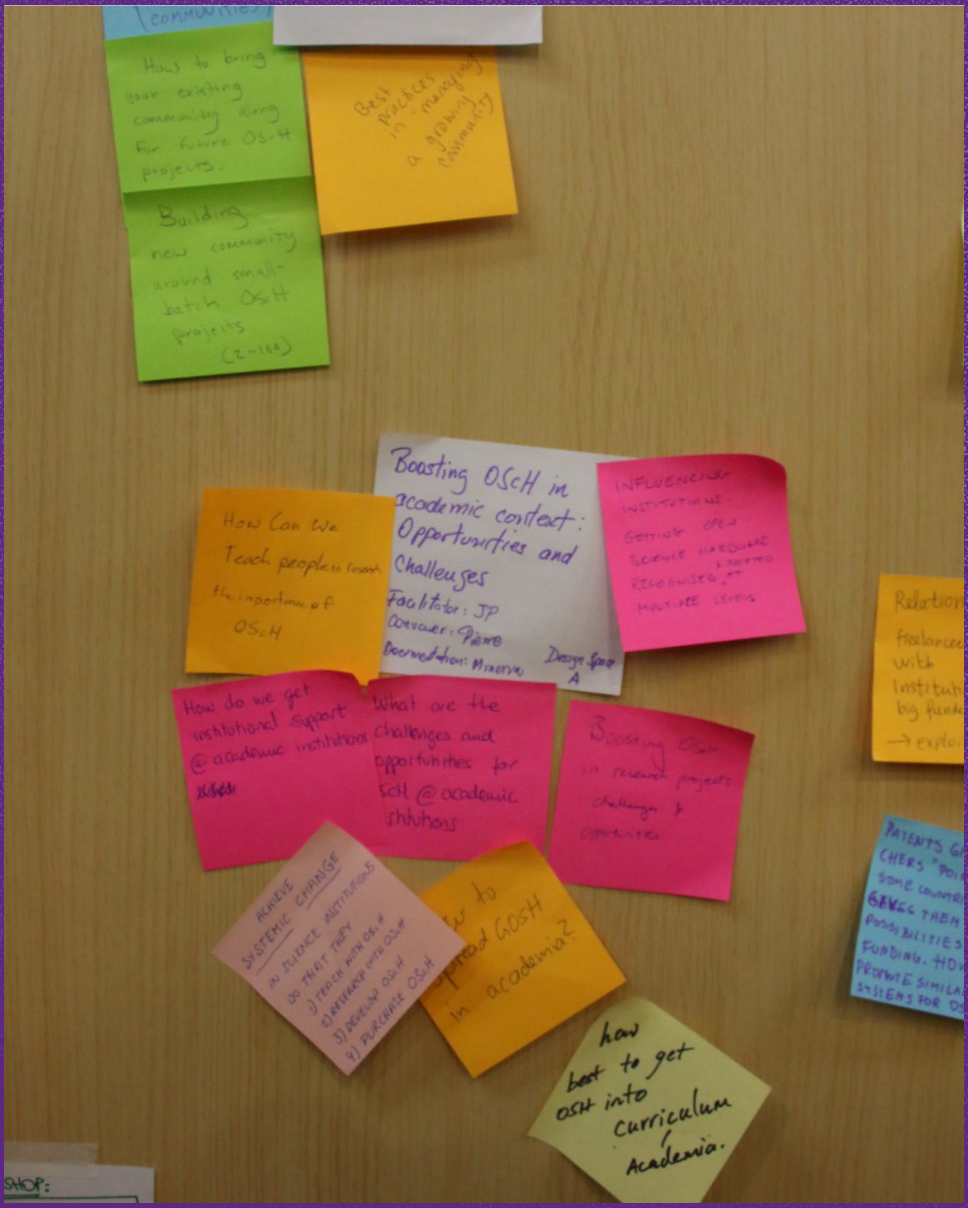
Documentation from an unconference session at the 2018 GOSH Gathering in Shenzhen



Images: Sourcing stationery and supplies at the 2017 GOSH Gathering in Santiago (this page). Wall with sticky notes (right).

CHAPTER 04

LOGISTICS



MONEY & LEGAL ASPECTS

FUNDRAISING

GLOBAL GOSH

If you are part of the organising group for GOSH global events, fundraising could take place with the support of the US nonprofit GOSH, Inc., which can operate as a charitable location for event payments.

Fundraising for global GOSH would typically target philanthropic foundations and companies; the process should begin 18 months in advance of a planned global GOSH.

Other organizations might also have funds or resources that they can contribute either in-kind or directly to event vendors.

OTHER GOSH EVENTS

If you are organising a GOSH regional or topical event, check with the GOSH Community Council if there is existing funding to support these.

GOSH, Inc may be able to support your fundraising and act as a fiscal sponsor (i.e. providing support for making and receiving payments as well as other administrative matters). You could choose to work with another institution or organisation depending on where funding is coming from and going to.

BUDGET

It is essential to track expenses against a budget for the entirety of any type of event.

Steps include:

1. **Build your budget.** Look at what grants are available and if there are restrictions on where and how funding related to the event can be spent. Many times categories are moveable between different lines, just ask. Check **the budget template**[64] we used in past events.

2. **Review the budget** with the administrative team of whichever organisation is managing the grants and funding associated with the event (e.g. GOSH, Inc.), ensure that spending is in line with grant guidelines. Identify what countries you anticipate funds will be sent to, so they can ensure bank transfers are doable.

3. **Transparency.** Once you start spending against your budget, request that the organisation administering your funds provide monthly income/expense statements (i.e. Profit and Loss statements and/or balance sheets) for the organisers to review and share where appropriate.

INSURANCE

You should obtain event liability insurance if applicable, and also ensure that your venue has its own public liability or similar policies. Both you and your venue should be satisfied by the level of insurance held by each party.

The organisation that is providing you with administrative support may already have insurance or can offer guidance: check with the university or other organisation you have partnered with to host the event.

For GOSH global events the GOSH, Inc. administration team can help support you in obtaining the correct types of insurance.

TRAVEL & ACCOMMODATION

VISAS

For most locations many, if not all, attendees travelling from abroad will be required to obtain a visa. The difficulty in doing this varies from country to country.

Here are some steps that you can take to prepare accordingly:

COMMUNICATE CLEARLY WITH ATTENDEES

Understand the type of visa participants need to apply for and advise them accordingly.

Put together a **template letter**[65] and checklist for people to use when requesting visas.

VISA COSTS

Ensure that if you are supporting people by covering the costs of their visas that this is adequately built into the budget

Find out in advance how much this will cost per participant as costs can vary drastically depending on nationality, so be conservative and assume your costs will be at the higher end.

Bear in mind that participants may need to travel long distances including across borders to apply for and/or collect their visa (e.g. from Nepal to India or from Sudan to Egypt), which can add $100s to the overall travel costs.

VISA TIMELINES

Understand the timelines involved in any applications and authorisations that the hosting or inviting organisation needs locally

In some countries events must be registered in advance and there are caps on the number and types of visas that particular types of organisations can sponsor at any given time.

Have a clear cutoff date for when visas must be received to continue getting support from GOSH organisers and to receive travel funding.

VISA REQUIREMENTS

As you select a location and venue, ensure they will be able to provide official visa letters for attendees. At universities there are typically offices that support visa applications. From experience, it is difficult for small nonprofits or community organizations to support the documentation required for visas.

Share a list of visa requirements and visa invitation letter requirements with both participants and anyone supporting visa applications e.g. must have the official stamp, must contain the passport number of the participant.

Bear in mind that people from certain countries may need more than one visa in order to transit through airports en route to their final destination. This means you need to factor in the costs of two visa applications or their flights need to be booked via a route which avoids this issue.

For example, many African travellers need transit visas for Schengen region airports in Europe but would not require a transit visa if travelling via Dubai. If you are funding travel, ensure that the supported participants are aware of this and have visas to cover their whole journey.

PLAN ACCORDINGLY

Be prepared to contact embassies, sometimes chasing up as the organiser of the event really helps move things along. Many universities have experience with this and have successfully moved backlogs of visas for previous GOSH events by directly contacting the local authorities, who have synced approvals from embassies in different parts of the world.

Be prepared that you will lose participants because they cannot get visas and account for this in your planning.



Tsinghua University campus in Shenzhen, location of the 2018 GOSH Gathering.

GETTING PEOPLE IN, OUT AND MOVING AROUND

AIR TRAVEL

At previous GOSH events, some attendees have received travel stipends. Typically these are determined by:

- attendee self-indication of need for travel support,
- event organisers determining the general amount of round-trip travel cost from the attendees location to the event location.

The GOSH global event has also previously paid for people to fly to visa appointments if necessary.

Some recommendations on air travel:

GENERAL RECOMMENDATIONS

Although many people will book their own travel, it is helpful for organisers to have a general sense of when attendees will be arriving in case assistance is needed.

Attendees should be aware of any transit visa requirements when booking plane tickets; some countries require visas even for a quick layover (see the VISAS section).

REIMBURSEMENT REQUIREMENTS

Attendees who are being reimbursed for travel should buy their ticket at least one month in advance to save on increased ticket costs.

We recommend compiling an FAQ detailing how and when to claim reimbursement, and what is and is not allowed. Here is a reimbursement FAQ from GOSH 2018.[66]

It should be clearly communicated to anyone expecting reimbursement for travel that people:

- must keep receipts for all expenses,
- will not be reimbursed for expenses such as on plane internet, upgraded seats, extra bags, etc.,
- will be required to submit a travel reimbursement request.

MONEY TRANSFER SPECIFICS

There may be restrictions on how and where money can be transferred. To take global GOSH reimbursements from GOSH Inc. as an example:

- GOSH, Inc. funds can only be sent via US domestic ACH, international wire transfer or PayPal and Wise (previously Transferwise) and not via other platforms.

- GOSH, Inc. is based in the US which currently has sanctions on countries including: Iran, North Korea, Syria, and Cuba. Funds from GOSH, Inc. unfortunately cannot be sent directly to participants from these areas. There are likely to be sanctions operating in other countries too so check with your fiscal sponsor.

UPFRONT PURCHASE

We recommend that plane tickets are only purchased for people upfront in extraordinary cases.

Most hosts and fiscal sponsors cannot act as travel agents so tickets should be identified by attendees, they should confirm they are able to transit through applicable countries and they should provide all relevant traveler information.

For global GOSH, although GOSH, Inc. is a very small operation, the administrative team can support with some additional assistance at any stage of travel if required.



GOSH community members pose for a photo after exhibiting open science hardware for the public at Shenzhen Maker Faire, which coincided with the 2018 GOSH Gathering in Shenzhen.

GROUND TRANSPORTATION

This is a significant consideration in choosing a venue location. Previous GOSH global events have all been in locations where there is city-wide transportation that allows people to commute individually or in small groups. There are other times where hiring a bus for the group is ideal. Some of the regional and topical events might be better served hosted in "retreat style" rural locations which will require more thought about airport transfers, travel for trips and meals and also emergency transport.

Thinking about transportation efforts ahead of time is important. There's nothing worse than arriving in a new country, where you may not speak the language, and not knowing how to get where you need to go.

Some recommendations on ground transportation:

PROVIDE CLEAR, COMPLETE INFORMATION

Ensure that people have clear instructions on how to get from the airport to housing and event locations, map it clearly, and ideally, have a local take photos/video of the route.

Provide information about where one can obtain cash and a local SIM card on arrival in the country.

Public transport: provide details on how to buy tickets and use the public transport e.g.: in some countries tickets can be bought on the station, and/or on the bus/tram/metro, and/or from local shops; some countries require tickets to be validated using machines on stations or on the transport itself or travellers risk a fine.

Taxis: provide clear instructions on how they will find the legitimate taxi operators. Let's avoid people getting scammed.

Participants may arrive in the middle of the night: ensure they have a pre-arranged safe way to reach the accommodation.

Provide alternate options— Uber, Lyft, other rideshare services depending on countries, a number to a local taxi company, etc.

GROUP SUPPORT

Consider having a welcoming committee at the airport. If most attendees are coming in on the same day, having a friendly face available to help as soon as people land is a wonderful way to start things out.

Connect travellers arriving at similar times so they can self-organise a group to travel together on public transport or share a taxi.

If travelling out of town, group people together for transfers.

Create a buddy system for getting around e.g. back and forth from the venue to the accommodation. There will be people that will not feel comfortable taking transportation on their own. Identify a group of volunteers who are willing to travel with these people.

If you have organised an event for the entire group that requires longer distance travel or is to an area outside of a city, consider hiring a bus(es) either from the venue or from a local operator to transport people.

Some local events have had local participants drive attendees. This is at the discretion of each driver, but is a good option for smaller groups or catering for participants who are less able to use local transport.



En route to an event after the GOSH Gathering.





Electric bikes in Shenzhen, location of the 2018 GOSH Gathering (top). Buildings in Shenzhen, location of the 2018 GOSH Gathering (bottom).

ACCOMODATION

HOUSING

GOSH global events and regional/topical GOSH events all manage housing differently, but generally the best model we've found is to locate housing in close proximity to the venue.

Some things to consider:

LOCATION

Check if the venue you will be hosting the event at have housing available (such as dorms).

If so, is the venue close enough to ground transport, food and entertainment options?

BOOKING ACCOMMODATION

There are different ways to do accommodation bookings. Many times it is easiest to reserve a block of rooms and have the organising group assign people to rooms as they come in.

We strongly recommend not relying on third-party services like Booking.com. If you do, note to attendees that you, as organisers, cannot ensure that reservations will be held.

Have your local organisers check in regularly with the housing management to cross-check who is booked for rooms.

SHARING ROOMS

At previous GOSH global events, we've requested people to have a roommate if GOSH will be covering the cost of their accommodation in order to support more people's travel funding.

In this case, when people acknowledge their attendance at GOSH, ask if they have a roommate preference.

SPECIAL REQUESTS

Provide suggested additional options for people travelling with families, who want their own kitchen to cook in, etc.

There are usually nearby hotels and you can point to apps like Airbnb. We recommend not commiting to individually assisting people in making these reservations as it is time consuming for a small organising team, unless special accommodations need to be made for them to attend.

FOOD

Food is critical to keep participants fuelled and feeling relaxed and at home, as well as providing an opportunity to get a glimpse into local culture. Do not underestimate its importance for a happy and healthy event.

GOSH global events and regional/topical GOSH events have all managed meals differently.

Some options to consider:

WHAT TO EAT

When attendees confirm participation, ask if they have any dietary needs (allergies, preferences). Do certain foods need to be prohibited at the event?

Communicate to attendees what meals GOSH will be providing.

If you are providing meals to attendees you should consider the various diets (vegetarian, vegan, gluten-free, halal, etc.) and if it is not possible to accommodate someone's dietary needs (because of the country you are in, etc), make sure they are aware of this well before the event.

When you provide meals to GOSH attendees, label the foods clearly and note which diets are not accommodated in each.

Try to make sure that fresh and healthy meal and snack options are included.



Fruit platters served during a refreshment break at the 2018 GOSH Gathering in Shenzhen.

WHERE TO EAT

If possible, use a venue cafeteria that provides people with a wide assortment of options or arrange for a number of options with your caterer.

Try to arrange at least one group meal out at a large restaurant or event hall.

Consider how to deal with payment if you are providing food.

- Many cafeterias will enable you to use a tab system or vouchers if participants in the meeting can readily be identified.
- Caterers are often happy to invoice.
- Restaurants will expect immediate payment, so ensure you have cash or a card available (and enough credit), considering this could be covering 100 participants.

If you are organising a GOSH global event, connect with GOSH, Inc. once you know how different meal options will need to be paid for as the administrative team can provide payment pre-, during and post-event.

Leave a night for people to go out on their own for meals. Local organisers can help by pointing to areas that might be interesting for small groups to venture out to on their own.

Cook together! Some of the fondest memories GOSH attendees have shared of previous events is when we were all able to come together to cook and share a meal. It's a big haul for a large event, but worth it if you're able to find the space either at the venue or the accommodation.

WHEN TO EAT

Consider where food is and how long it takes to get it when planning the length of breaks. If you need to walk 10 min to a dining hall and spend 10 min in a queue, a 45 min lunch break will be too rushed.

Plan plenty of coffee and snack breaks, participants will be jet lagged and also wanting to talk to each other outside of sessions. If possible, keep refreshments inside or very close to the meeting rooms.

Make sure that there is a constant supply of drinking water in or very close to the meeting room so that people stay hydrated.

In previous years we have issued GOSH reusable water bottles so everybody has one.

A snack table will also be very welcomed and oftentimes filled by the participants with food they have brought to share from their home country or that they have picked up locally to try.



Jenny Molloy during an evening trip to eat at a local market in Shenzhen.

CLOSING LOGISTICS

GOSH global event organisers can rely on the GOSH, Inc. administrative team for closing the financial portions of the event. We include below this list of activities, so that both GOSH global and GOSH regional/topical organisers have a sense of the closing process.

TRAVEL REIMBURSEMENT

Within a month of the end of the event, all travel reimbursements should be submitted. This includes a reimbursement form and all relevant receipts. GOSH, Inc. will work with attendees to receive their reimbursement via ACH, wire, PayPal/Wise (previously Transferwise). Attendees can expect to have received their payment within a few weeks from the date they submit their form after the event.

PAYING OTHER VENDORS

There will most likely be expenses that need to be resolved after the event, invoices should be sent to the GOSH, Inc. administrative team for payment.

CLOSING THE BUDGET

Once all expenses are paid (with a goal of this being wrapped up two months after the event) a final budget vs. actual is built and shared with GOSH organisers and the broader GOSH community.



FluoPI, an open source multi-fluorescence imaging system for teaching and research in biology and bioengineering, during a workshop at the 2018 GOSH Gathering in Shenzhen.

APPENDICES

ENDNOTES

1 https://openhardware.science/
2 https://forum.openhardware.science/t/documenting-a-framework-for-organising-gosh-events/2824
3 http://africaosh.com/
4 http://regosh.libres.cc
5 https://forum.openhardware.science/c/communities/great-lakes-gosh
6 https://wemakeit.com/projects/reseq-reuse-dna-sequencers?locale=en
7 https://reseq.hackteria.org/
8 https://www.bath.ac.uk/events/open-hardware-from-academia/
9 https://openhardware.science/gosh-manifesto/
10 https://openhardware.science/gosh-manifesto/
11 https://openhardware.science/gosh-manifesto/
12 https://openhardware.science/global-open-science-hardware-roadmap/
13 https://gitlab.com/gosh-community/gosh-roadmap
14 https://forum.openhardware.science/t/gosh-writing-sprints-2021-2022/2694
15 https://2021.oshwa.org/
16 https://makerfaire.com/
17 https://docs.google.com/document/d/1slgxGpyaxjYnW8zhcKHVoPLhErU_Qz7t/edit
18 https://openhardware.science/gosh-2017/gosh-code-of-conduct/
19 https://openhardware.science/about/gosh-history/
20 https://openhardware.science/global-open-science-hardware-roadmap/
21 https://openhardware.science/about/gosh-history/
22 https://docs.google.com/document/d/1il6SGMPIRguEvy0omRmdacMVVuBs_F91fOihZOmysts/edit?usp=sharing
23 https://aorta.coop/
24 https://facilitation.aspirationtech.org/index.php?title=Main_Page
25 https://facilitation.aspirationtech.org/index.php?title=Facilitation:Index
26 https://facilitation.aspirationtech.org/index.php?title=Facilitation:Index
27 https://aspirationtech.org/papers/creating_participatory_events
28 https://openhardware.science/gosh-manifesto/
29 https://gitlab.com/gosh-community/gosh-roadmap
30 https://gitlab.com/gosh-community/gosh-roadmap
31 https://docs.google.com/document/d/17gvLf8YnKzKXSHIlQrNVfCB-XWgDhN6ZWYIswJKF3FQ/edit#
32 http://culturalorganising.org/wp-content/uploads/2016/10/equalityequity.jpg
33 https://docs.google.com/document/d/1AlnesI_jwhqJ2nZlIgmuOowZeergzCg3/edit#
34 https://docs.google.com/document/d/1AlnesI_jwhqJ2nZlIgmuOowZeergzCg3/edit#heading=h.jgv53v1qucgd

35 https://docs.google.com/document/d/1AlnesI_jwhqJ2nZlIgmuOowZeergzCg3/edit#heading=h.tyjcwt

36 https://docs.google.com/document/d/1AlnesI_jwhqJ2nZlIgmuOowZeergzCg3/edit#heading=h.gjdgxs

37 https://docs.google.com/document/d/1AlnesI_jwhqJ2nZlIgmuOowZeergzCg3/edit#heading=h.30j0zll

38 https://docs.google.com/document/d/1vup-sYWsKzJFinG4o8a0KufUHXzqrPoEIwLfAg3ba-E/edit?usp=sharing

39 https://docs.google.com/document/d/13NzEDHKYqHogWvOSFgUaEuOkbsKVr2vW7G3J8KYYpOk/edit

40 https://openhardware.science/wp-content/uploads/2021/05/GOSH-Shenzhen-Survival-Guide-4.pdf

41 https://docs.google.com/document/d/1ooBXGVmsm1zu3LA0mziV8vGsN0L9nxSt/edit

42 https://twitter.com/ASpittel/status/1387489000517259264

43 https://web.inf.ed.ac.uk/infweb/health-safety/risk-assessments/generic-mechanical-workshop

44 https://intranet.birmingham.ac.uk/hr/documents/public/hsu/hsuguidance/10raw.pdf

45 https://www.gla.ac.uk/media/Media_325349_smxx.pdf

46 https://openhardware.science/wp-content/uploads/2018/04/GOSH-2018-Sponsorship.pdf

47 https://tweetdeck.twitter.com/

48 https://docs.google.com/spreadsheets/d/1LDyGL9NWl4FPSbxoHP4v7XjCACW5-kHYWnhApW5yO0c/edit#gid=0

49 https://docs.google.com/spreadsheets/d/1LDyGL9NWl4FPSbxoHP4v7XjCACW5-kHYWnhApW5yO0c/edit#gid=2009705559

50 https://docs.google.com/presentation/d/1VeDJRb9T0WtQ2le73JHjkcZ5E9-z2EkR/edit#slide=id.p1

51 https://docs.google.com/presentation/d/1VeDJRb9T0WtQ2le73JHjkcZ5E9-z2EkR/edit#slide=id.p1

52 https://drive.google.com/file/d/1EP1fnOvJaWPUq5U0m3MOh_A7FLgpDe_6/view?usp=sharing

53 https://drive.google.com/file/d/1D4EDc0A8wVuqoNFRW5gu0cm7gY7Ps87Q/view?usp=sharing

54 https://drive.google.com/file/d/1XjqsLU4A8i1njA15andvxULhGpoFIb6e/view?usp=sharing

55 https://docs.google.com/presentation/d/12zNFbQVT0okGhRQg0uV9xvOcApan4YgjEdBMK9e8gXU/edit#slide=id.gb7541fc89_1_17

56 https://forum.openhardware.science/t/day-3-understanding-user-profiles-documenting-open-science-hardware/1441

57 https://www.flickr.com/photos/goshcommunity/

58 https://zenodo.org/

59 https://openhardware.science/wp-content/uploads/2017/12/GOSH-2017-program-report-final-v1.0-1.pdf

60 https://openhardware.science/wp-content/uploads/2019/02/GOSH-2018-community-report-juanma-compressed.pdf

61 https://docs.google.com/presentation/d/1EDT0Mzs8R5UlJeKjmnHMhhnSAVEVP2QFPV_riY_hhhA/edit#slide=id.p4

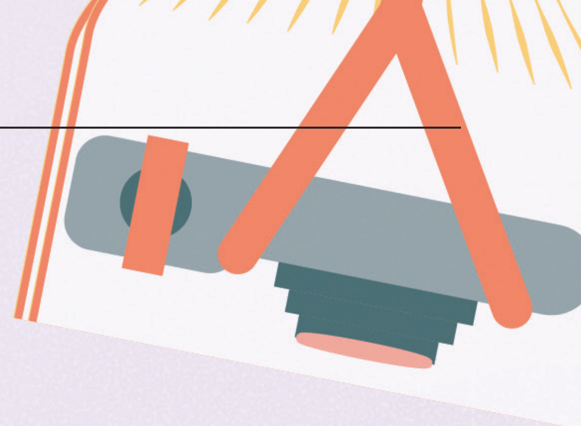
62 https://docs.google.com/document/d/1slgxGpyaxjYnW8zhcKHVoPLhErU_Qz7t/edit

63 https://openhardware.science/wp-content/uploads/2020/08/PublicLab_GOSH_2018-19-final-narrative-report.pdf

64 https://docs.google.com/spreadsheets/d/1WrBgomYNGptQbC7Eew-2kbHtvOemDQlOunzhDoDrm-Q/edit#gid=0

65 https://drive.google.com/file/d/1d0W6nsw6KTwT1gvFPo6wss1LMyd4iAPA/view?usp=sharing

66 https://docs.google.com/document/d/1HLe0GtJevVzJCR4AN-3ARt1hdyH93wiIyMKhUorFN_Q/edit#





PROFILES ON GOSH COMMUNITY MEMBERS

URS GAUDENZ

GaudiLabs
Global Hackteria Network
Switzerland

Urs Gaudenz is a micro engineer, founder of GaudiLabs and Global Hackteria Network. With an extensive background in electronics, mechanics and software, he worked for high tech companies and the Lucerne University of Applied Science and Arts. He put up GaudiLabs, defined as "creative spaces for working, thinking and living where culture and technology meet", from where he conducts, teaches and promotes open research in open source culture technology. He also develops and sells open hardware.

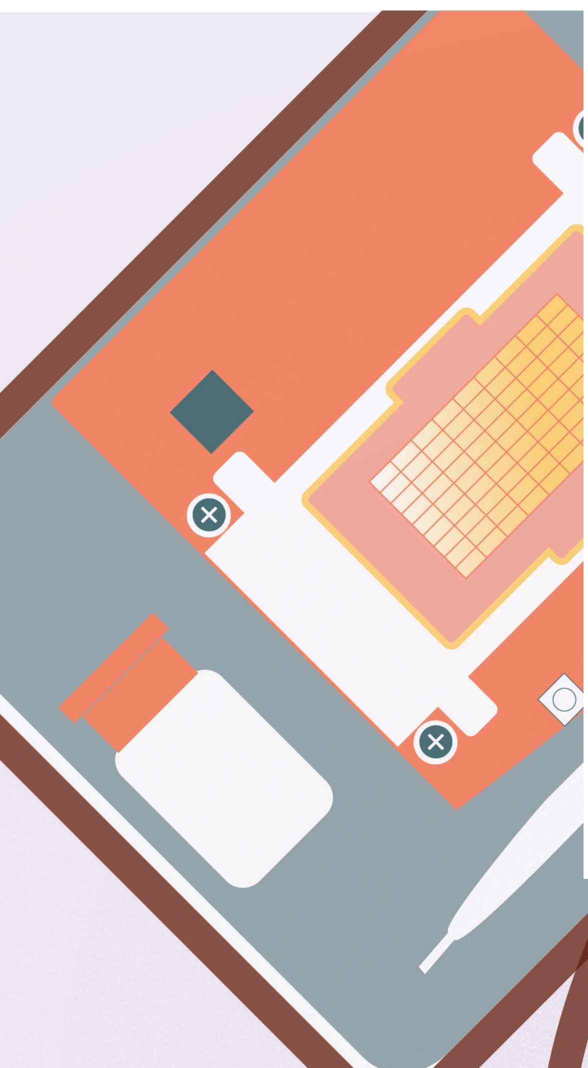
Hackteria started in 2009, when Andy Gracie, Marc Dusseiller and Yashas Shetty met at Interactivos, in Medialab-Prado, Madrid (Spain), concerned with do-it-yourself biology for artists. "I knew Marc from the Swiss Mechatronics Arts Society. I think Yashas Shetty coined the name, playing with 'hacking bacteria'. We started by turning hacked webcams into microscopes", remembers Urs. "We organised the first workshop in Berlin, and then annual Hackteria labs. The first was in Switzerland and then in India, Indonesia and other places, growing the network". Hackteria started as a platform and then turned into a global network for people interested in open science, do-it-yourself biology and open biological art.

SOMETHING GROWING UP IN GENEVA

"In 2015, Marc heard rumors of something growing up in Geneva. We met François [Grey] for a beer and he said: 'There is an idea of doing something with open hardware for science in CERN. We want to start a network'", recalls Urs. "He was already in contact with Shannon [Dosemagen] and Jenny [Molloy]. I thought 'it's a great idea to meet up'. We had met Jenny in a Tech4Dev meeting, in Lausanne. Also Tuuli Utriainen, who had worked with me at the University of Lucerne, was in Idea Square, the creative place at CERN, and said: 'Why don't you do something in this creative technology space?' At the same time, we were thinking about doing something with Public Lab. The puzzles were fitting together".

FORMATS, VENUES, PEOPLE

"We got a lot of practice in doing workshops, connecting people and doing good open hardware. So when we started thinking about GOSH, we tried to bring in our experience on different formats", says Urs. "Number one is the open lab, pretty similar to unconferences but not just post-its, also prototyping, doing stuff and exchanging. Also, workshops and



"OPENNESS IS BEING TRANSPARENT, HONEST AND DOWN TO EARTH"

peer-to-peer skillshare, show and tell, exhibitions, hackathons. We also like to go out on field trips, inspired by Andy Gracie. And of course, staying late drinking beer, or without beer", enumerates Urs.

"We thought we shouldn't do GOSH every year at CERN: 'Let's go out, every year somewhere else', says Urs. "And also a good choice of people is important. We discussed, in Hackteria and GOSH, about doing open calls or inviting people. I think it should be a bit of both: an open call to expand your network with random interested people, and also to cherry-pick some people to curate the event and set the spirit", he remarks. "It is also great to meet people who have accomplished something, like the guys from Opentrons that we met in Shenzhen or Backyard Brains in Geneva, so new people can get motivated seeing others doing great stuff. Because for me, the primary goal to join this network is that we need more open hardware for science. It probably still won't be ubiquitous by 2025, so we have to focus on this even more. There are other networks for everything else", states Urs.

STREET CREDIBILITY

"It's important doing show and tell, bringing stuff, doing hardware right on the spot in hands-on activities, on a not too high up level", he highlights. I usually don't join meta-level discussions. With Hackteria and Marc, we often have a little booth where we try to sell things: a practical approach. I try to bring in the technical aspect: doing a workshop, building a lab, experimenting."

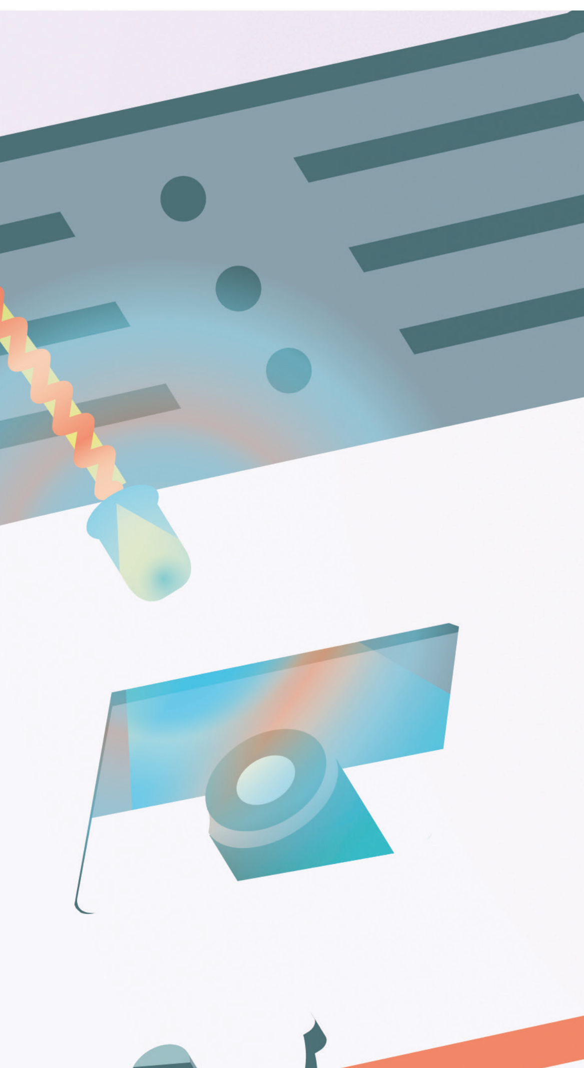
He talks about 'street credibility': "Don't pretend too much, don't talk about things you have not done yourself or you don't know. Rather be honest about what you can and cannot do, what works and what doesn't. Among academics, corporate and startups people there is a lot of pretending and showing off: 'I have this nice device, you can do everything, you can detect malaria with it, we're going to save the world, just give us some millions'. People just make up big words. I would say: 'I'm selling this, it's open hardware but it's really difficult to build and most of the time it doesn't work, and I'm happy if someone wants to join me". Being transparent and down to earth is vital. I think we got the GOSH network to get people to open up their hearts and be honest about what they are doing, and also what they aren't sure they're gonna get", says Urs. "That's also part of the openness. When I talk to people in startups, if they say "It's a secret, we cannot talk about it', it's often because they don't have anything. When something is open, everyone can see if there is not much".

OPEN HARDWARE EVERY DAY

"In Hackteria, two months before an event we start doing activities and getting excited: emailing introductions and first projects, organising first meetups or exhibitions. That creates the atmosphere. Then the event is like the peak, not an isolated slot. It should be much more", he remarks. "With Marc we usually arrive before in the event location, and we suggest making this phase part of the formal program. We had a great time a week before the last GOSH in the SteamHead hackerspace. It's always valuable to have a bit of time earlier and after. It can be less formally organised, but it still should be organised. It is good to think that the event starts a month or two before and it ends two months later". And he sums up: "I hope people take more time to work on open science hardware during the year. The GOSH event should be an opportunity to share what we have been doing. I hope that more people will take the experience from GOSH into their everyday life."

THOMAS HERVÉ MBOA NKOUDOU

Founder of Mboalab
Co-lead of Africa Open Science and Hardware (AfricaOSH)
Cameroon



Thomas Hervé Mboa Nkoudou is a researcher in information and communication, with a focus on the maker movement and biohacking in the African context. With a background in biochemistry, he promotes Do It Yourself Biology to democratise biotechnology in Africa. He was the president of the Association for the Promotion of Open Science in Haiti and Africa (APSOHA). He organised the conference "Biohacking in the medical field: perspectives for developing countries", in Yaoundé, Cameroon, in 2017. He founded a Community Biology Lab in Cameroon, the Mboalab, which is part of the Bioeconomy Lab. He co-founded the Africa Open Science & Hardware network, and is in charge of the African Institute of Open Science and Hardware launched by the AfricaOSH community.

As part of the Open and Collaborative Science for Development Network (OCSDNET), in 2016 he knew about the first GOSH meeting and contributed to the GOSH Manifesto online. The next year, he attended the second gathering in Santiago (Chile). "There I met Jorge Appiah, from Ghana", he remembers. "We found that a gathering for open science hardware could be a very good opportunity for Africa , but it was very important to contextualise it according to our own vision (as Africans). Then, we decided to launch the Africa summit in order for Africans and people working in Africa to have a conversation around open science, and the risks and opportunities for our continent, to adopt it". The first Africa OSH Summit took place in Kumasi, Ghana, in April 2018. The second one was one year later in Dar-es-Salaam, Tanzania.

DEMOCRATISING THE PROGRAMME

"The uniqueness of the GOSH community is the format of the events: not a very long talk or presentation, and then all the sessions are interactive. People are able to do a lot of hands-on activities, which is very important for makers", says Thomas. "You really feel like a family, so you are always involved in many things, doing stuff, designing the event. The programme is not fixed at all, it's designed day after day by the participants, so it's a way to democratise it. When we launched the call for applications, we designed our form in such a way that each applicant was able to tell which kind of activities they wanted to do during the Summit".

PARTICIPANTS: QUALITY OVER QUANTITY

"People joining the event are really open to helping others", highlights Thomas. "We received a lot of applications and we had to select, because we couldn't fund

"IT'S IMPORTANT TO CONTEXTUALISE THE EVENT ACCORDING TO OUR OWN VISION"

the travel for all, as flying inside Africa is very expensive. We received some funding from the main GOSH, from OpenAir (Open African Innovation Research) and some international organisations, but it was not enough to cover all the expenses, so we worked collaboratively to choose some people. Marc Dusseiller advised me then that the greatness of the event doesn't come from the number of participants, but from their quality. We were about 60 in Ghana."

"We looked for people that could have a big impact in our continent. So we verified all the information about the applicants, to avoid bringing someone who was not really involved, or who didn't share the ideas of social innovation or open science", says Thomas. "If you're applying to come to an event with a solution without wanting to share it, just to sell it, we cannot accept you. Sharing the design and the code, and helping others, is one of our core values."

"For us, being African is a specific way to be, it doesn't matter with your geographical position, your nationality, or the color of your skin", states Thomas. "That way to be is mostly embedded in the ubuntu philosophy, with community as a key component: the idea that you cannot live without the others. So if someone has these values, the idea of community, the idea of looking for justice and equity, I'm sure that you will meet the criteria of Africa OSH. The idea of community is universal, but for someone who is not born in Africa it's important to have an idea of our context, in order to better understand our needs."

HOUSEKEEPING RULES

"We had a steering committee and a big team of volunteers to organise Africa OSH, and also a local committee from the host country. We used to share the documentation on how the event should look like in a shared folder, so everybody could add input", explains Thomas. "During the event, we implemented the housekeeping rules, a kind of a code of conduct to avoid issues related to ethics. We don't call it 'code of conduct' because sometimes a lot of rules can limit the interaction during hands-on activities, and people could not feel free to talk to each other. In Africa, where people are usually warmful and really like to talk and laugh, it would be difficult to implement a strict code of conduct."

TIME AND SPACE

"I think three days is a short time", says Thomas. "Some makers need two or three weeks to install the equipment they need, and if you want to acquire some skill, it can take you one week working every day. So it's very difficult to handle it in just three days when you have a lot of activities to do". He adds: "Having activities in nature is very important also, being able to move from the venue to somewhere where you can have some experiments in real life. In Ghana we didn't prepare this, but Andrew [Quitmeyer] wanted to run a workshop in a natural garden, so we moved to this place and we spent all day there. It was very interesting".

BARRIERS

Thomas sums up by calling attention to political and financial barriers: "GOSH participants from Africa cannot really attend the events when they take place out of Africa, due to visa issues. We are missing a lot of events because they are taking place in western countries. So if we want a diverse community, it's very important to take care of such realities. That is why I'm calling for a future global GOSH to take place in Africa."

SHANNON DOSEMAGEN

Environmental health advocate
Shuttleworth Foundation Fellow with Open Environmental Data Project
GOSH Core Organiser, 2016-2018
Public Lab co-founder
United States

We make and do things together and we also plan for the future", says Shannon Dosemagen reflecting on what makes GOSH unique. "Technology is being built. We have to focus on the contexts, the politics: to actually have tools and make sure they're useful. For that, you have to create an atmosphere of experimentation, where people enjoy making things together. We're not just coming together at a hackathon or conference: what makes GOSH special is how people get together to do and make creatively, and also have good conversations to figure out what we have to change to meet our goals".

Shannon is part of the core of GOSH from the very beginning. She has been working on how communities can use science and technology for environmental justice for over 15 years. "Open hardware was not well known at that time", she remembers. "We worked on the use of technology: communities should be able to build the tools they need, take their own sample, and make sense of them. Making accessible technologies, ensuring that science is accessible, helped to strengthen the organising they were doing".

In 2010 she co-founded Public Lab, a non-profit organisation to democratise science to address environmental issues. From previous work in the open ecosystem, she had met Jenny Molloy, Francois Grey and Greg Austic. In 2015, they felt that momentum had grown for open science hardware across the sciences. "So many people were using open hardware tools, it was the moment to get together to build collectively", she explains. "In the type of work I do, we can build as many tools as we want, but if the policies aren't there to support implementation of the resulting information, it's difficult to get useful data".

"2016 [the first GOSH meeting] was about 'who is going to show up'?", she remembers. "I'm aligned with community science and social science, others were interested in art, biology, physics … We were looking for a community: who we are. We cooked meals together, staying at the same compound, as a summer camp. We were building a family around this idea of open science hardware. This was carried on in the different GOSH events, it's not that you go for the day and then go home", she says. "Geneva was about setting the ground, through the Manifesto. In Santiago we started to see hands-on workshops, the conversation got specific, we had a public event and we started building collective goals. In Shenzhen we expanded, coming together with the community. It was stepped progress ."

WHAT IT TAKES

How to build that family? Shannon was a core organiser in the three GOSH global events. She highlights three key points: time, team, and kindness.

"WE ARE BUILDING A LIFETIME FAMILY"

"Logistically, the timeline has to be extensive. The core organising group would work intensively for up to five months before bringing other organisers in. Selecting a location and local partners is very intensive. There's a lot of invisible labor: hotels, catering, visas, even booking tickets. The programme group, four to five people, design the small talks and the evening activities. The core team should be small enough to make decisions. In total, including people in charge of the documentation, evening events, and Code of Conduct, the team could be up to 20 people."

The selection of participants is essential. "Putting demographic goals in place for the events helped us to take a critical eye of the community from the beginning", says Shannon. "We put a lot of effort into it". GOSH gathered people from 40 countries.

A SENSE OF TOGETHERNESS

"At the opening, we lay the ground with a short talk, 'this is why we're here, this is who we are, and let's recognise our history', making sure that we're connecting the dots between people as early as possible, and setting the stage for a group where you can find family. I think about the communities I belong to as my lifetime family: families are never easy. We have to all work very hard, but it nets so much. We go through the Code of Conduct, we train on how to facilitate. By laying those seeds, you see how it works", says Shannon. "To build a sense of togetherness, it's key to ensuring the in-between times: eating together, listening to music, socialising… When some people can be dancing and some others can hack something in the same space, that builds an atmosphere not too rigid and strict, and allows people to find their spots".

"During the event, I don't sleep", she laughingly remarks. "I'm hosting, so it's my job to make everyone feel welcomed. Sometimes that's just to sit down and get to know a person or give a little bit of extra support. I think of myself as a support unit, and I am there for everybody. It's important to have people in that role. And something will always come up, so the team needs someone for troubleshooting, to allow everyone else to keep going." She writes down the names of those who worked "or demonstrated any active act of kindness, like staying behind to take care of the bags so others could eat lunch". At the end of the event it can take 15 minutes to thank everyone, but "making sure that people feel appreciated and acknowledged is essential".

Advice on planning a session? "It's important to have a good facilitation plan and a goal: where you start and where you want to be. If you can plan ahead of time, it works to activate the people beforehand: 'read this, do that'. If you are a native English speaker, slow down, write and visualise as much as possible. And always encourage people to participate in sessions outside of their area of expertise: to listen, learn and help to spread knowledge. It's important for everyone to learn the moving pieces."

"The bottom line would be encouraging kindness to everyone, and being present", summarises Shannon. "I would encourage organisers to be hand-raisers, say 'I am here to help' (as the event grows, think about how to distribute the intensity of the efforts). We never really know what people are experiencing, what's in someone's background unless we try and get to know them. The basis for Codes of Conduct is very western, and as the community grows we should be conscious of this history, and ensure that our community guidelines reflect that there are people from lots of cultures and countries in the room. Be kind, open, inquisitive.. We need to have a willingness at times to say 'Can you go deeper? I really want to understand'. And that's how we build community and stronger conversations."

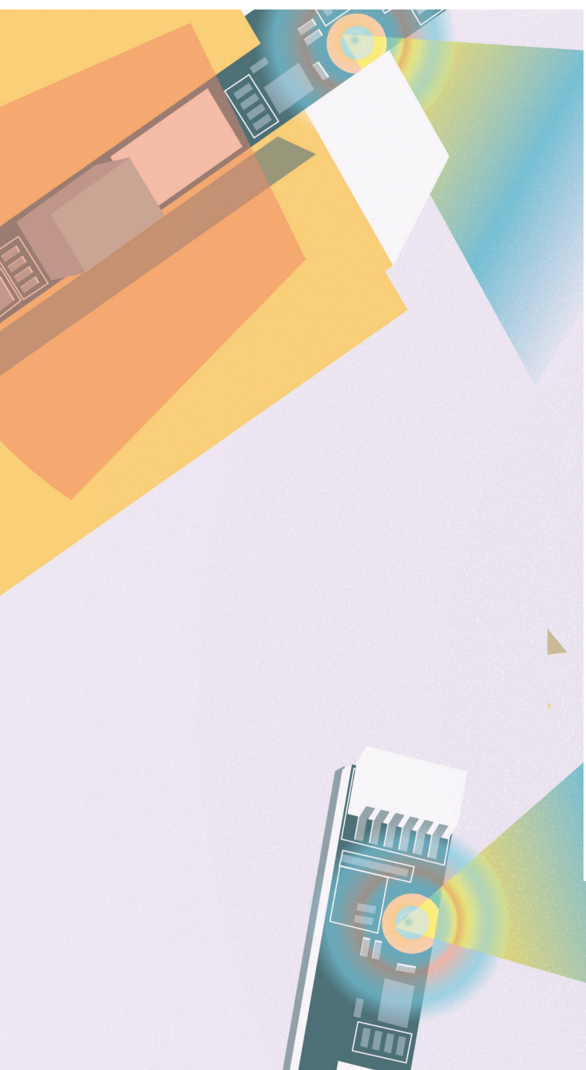
RYAN FOBEL

Sci-Bots
Core organiser of Great Lakes GOSH, 2019
Canada

Ryan Fobel is a biomedical engineer, a hardware hacker and an entrepreneur. During his PhD studies at the University of Toronto, he designed an open source droplet-based digital microfluidic platform for automation of biology and chemistry, DropBot, which was built in more than 20 labs around the world. He is part of Global Hackteria Network and co-founder of Sci-Bots, a startup to develop tools for automating and miniaturizing biology.

“During my Master’s degree, I was developing software for processing neuroimaging data, and found open source really enabling, especially in contrast to the proprietary MRI hardware I was working with.. It was very difficult to get the raw data I needed for my research”, remembers Ryan. “I became increasingly interested in physical computing and started playing with Arduinos and built my first 3D printer in 2010. I started looking for a PhD that would combine my interests in biology and hardware, which led me to the field of microfluidics”.

“I went to some open hardware summits and I started to build a bit of a network. I met Greg Austic in 2013, before GOSH. We were talking about the potential of open source hardware within science”, recalls Ryan. “In the first GOSH event, I was so excited: ‘Wow, there’s people here that are like me!’. Because even within my own lab, I felt very much on my own. So it felt amazing to find this community”. Ryan was part of the three global GOSH events, and in 2019 he and Greg Austic organised Great Lakes GOSH, a regional meeting in Toronto.





MEANINGFUL CONVERSATIONS

“GOSH is unlike any other conference, because of the self-organising unconference style and the diversity of people. Also, there is less focus on technical details, and more discussion about values and the impacts of technology on society. And it’s way more interesting and fun”, he states. “I remember at CERN, Marc [Dusseiller] and the Hackteria people had invited a group of artists to perform during one of the breaks. They started playing this really loud industrial noise music, and I remember thinking: ‘what is going on?’. But I think that was an important part of it; pushing people outside of their comfort zones. GOSH was very inspiring: so many ideas and interactions with really interesting people. I had meaningful conversations with most of the people there, which is pretty special”.

“Before every GOSH event, the organisers provide basic facilitation training: what you should and shouldn’t do to make sure

"FINDING PEOPLE TO MEET AND COLLABORATE"

that everybody gets to contribute and no one dominates the conversation. GOSH sessions feel more like a conversation rather than a lecture", says Ryan. "We tried to replicate that facilitation aspect at Great Lakes GOSH; luckily Greg has a lot of experience and training. It's important to have some people involved who can model for other people, because it's really important to make the event work".

GREAT LAKES GOSH

"When we were organising the Great Lakes event, it was really helpful that we had a lot of organisational materials from previous gatherings to lean on. We used a similar application process, looking for balanced representation from different groups", says Ryan. "We couldn't afford to fly people from all over the world, and one of our goals was to have more of a regional focus. When we put out the application and posted it in the forum, we got a really diverse group of people applying. I'm sure that it was a lot more work in the earlier GOSH events, but now you start out with this diverse community. We got a really interesting mix of people right off the bat. "

Around 35 people gathered for a couple of days at the University of Toronto and at an eco education centre called The Evergreen Brickworks. "It would have been much harder to do without previous GOSH's spreadsheets. Nevertheless we had to figure out a lot of stuff, because we had a very limited budget", explains Ryan. "It's challenging to run an event without an organisation to handle money. We ended up setting up a Paypal account to collect money and reimburse expenses, but that's not ideal. I had to personally book the venues under my own name, which is a bit risky: if anything goes wrong, you don't have insurance". They covered costs by charging some attendees that were able to pay a fee, like those sent by companies or universities. "We used some of that money to subsidise other people who wouldn't have been able to afford it. We tried to figure out how to move the money around and charge the right amount to cover all the expenses", he says. "It was very DIY. A bit stressful, but fun. We tried to involve as many people as we could, but a lot of the heavy lifting fell on Greg and I… By the end, I was super burnt out. Next time, I'd make sure to have a bigger team".

RETREAT

After the main event, a smaller group stayed for a couple of days. "10 or 15 of us went to a little cabin one hour outside Toronto. It was less structured: just people hanging out, cooking together, and doing little impromptu sessions. It had more of a summer camp feel", says Ryan. "If budget and organizational capacity are limited, it might make sense to focus on these types of casual retreats, and less on the more formal events, because this was a lot less work to organise, and a lot cheaper", he reflects. "But this also has implications on numbers: you cannot have a retreat in a cabin with 50 people. It would be great to have a week just working on stuff together, pushing forward a common project. It's harder to work together on hardware remotely", he points out. "GOSH is amazing, it has introduced me to this wonderful community, but they're spread all over the world. The motivation for a regional event was to build community at local level, so that we could meet more frequently to collaborate".

RACHEL ARONOFF

Scientific Director of Action for Genomic integrity through Research! (AGiR!)
President of Hackuarium
Switzerland

Rachel Aronoff is a molecular biologist by training who works on genomic integrity, a big picture concept for public health, which pulls together all the molecular genetic details of cells, including active RNAs and the understanding of DNA as dynamic and repairable. She was born and raised in the US and currently is based in Lausanne, Switzerland, where she helps coordinate a community lab association and biohackerspace called Hackuarium. “Hackuarium is all about open science, encouraging participatory research and getting people to not just share knowledge but know-how. It’s about getting people to understand more about science, and giving them the opportunity to do science,” explains Rachel. It can also work as a kind of incubator for science projects and startups. From working at Hackuarium she met Marc Dusseiller and Urs Gaudens, the founders of Hackteria Global Network, who were part of GOSH since the first meeting, in 2016. “Urs brought Jenny Molloy along to a biohacker meetup event at Hackuarium,” she remembers. “And I found out about the GOSH activities because one of the early Hackuarium members, Sam Sulaimanov, from the Hackuarium project Octanis, said ‘Aren’t you going to Shenzhen for GOSH?’ And I said ‘oh, why not?’”

DEMOCRATISING COMMUNICATION

“I had never seen people use so many stickies in one place,” laughs Rachel when she remembers the setting of the agenda through the unconference process, during the first day of GOSH 2018. “Everybody was brainstorming, gathering the stickies up and putting them back together in different places. In the end it was very interesting, that sort of democratising communication, because sometimes it’s just the brave loud people who talk the most,” she highlights. “Everybody at GOSH is quite supportive, and people try not to be too judgmental. It’s all part of the whole ethics,” she remarks. As the main ingredients for a good meeting, she mentions: “You need excited people, and a good space”.

MICROSCOPES FOR ALL

“I had been working with different DIY microscopes that I learnt about over the years, especially the origami microscope, the Foldscope”, tells Rachel. “So I came to Shenzhen and thought it would fit perfectly with the GOSH ideals”. Rachel co-conducted a workshop on DIY microscopes with Julian Stirling, who was showing the new developments of the OpenFlexure microscope.

“We did a sort of workshop with this origami paper microscope with a little glass ball lens. It was super hands-on and easy, really a making type of thing”, describes Rachel. “Everybody just made it. We also tried to do an experiment with one of these 3D printed ideas for fluorescence microscopy, but it didn’t look very good. Next time, I’ll try to make sure to have

"SHARING NOT JUST KNOWLEDGE BUT KNOW-HOW"

more samples for things to look at once the microscopes are made, so people can play around with what they've done," says Rachel. "Through my participation, I got to know the people who developed the OpenFlexure microscope. I came home from GOSH with this great idea of using it for one of my main AGiR! projects, and that was one of the things that we did manage to do before the pandemic really hit us, to see nuclei in cells with epifluorescence on the OpenFlexure. That's what I brought home from Shenzhen: amazing new ideas, the basis for more work ahead".

PATENTS ARE NOT HELPING

"It is very clear that there's one kind of open science where you put out an open access journal publication, as in the case of the Foldscope, but then there's the other thing where they want to go ahead and patent it, and make a big deal of money out of it," states Rachel. "In fact, after their open science publication, Foldscopes were patented, so we have always used the 'old-school' version found in a blog from an old team member for our workshops. We call it the oFoldscope. I had talked with some people in GOSH 2018 before doing the foldscope workshop: 'Will I get in trouble for doing this?' They said that probably it's no problem if you're not making money. Basically, the companies who complain about patent infringement have to prove that they lost money because of whatever you did. Nobody lost money because of our workshops, like my GOSH session."

"I think it's really important to emphasise that documentation of experiments and open science is really the way forward for our world," reflects Rachel. "All this secrecy, with startups not sharing things, causes so many problems... Now there's this whole thing about the vaccines and whether or not they could share the methods that they use to get rid of the double-stranded RNA and to label the RNA so it's not recognised by the immune system and so on... And these things are molecular biology, you should be able to teach them to people even in resource-strapped settings, although scaling up production is a big technical challenge", she claims.

"The point is that when people do open science research, they should also be trying to emphasise the importance of sharing not just knowledge, but know-how, instead of just trying to make a secret process for intellectual property (IP) protected by a patent. Patents are not something that help our world improve in general," remarks Rachel. "I think that people would still make profits, if there is a market for their product, without having to keep all these secrets. As ninety percent of startups fail, that's a lot of effort for our whole society being wasted. We support the basic research that led to these startups, and then they make it all secret and nobody is supposed to use what they make. And then what happens? It turns out our Corona Detective methodology has a patent for both the amplification and the detection strategy, and we still don't know if the licensing fees will be too steep to enable at-scale production and surveillance screening."

PRAYUSH BIJUKCHHE

Tech Lead of Karkhana (2014 - 2020)
Nepal

PRAYUSH BIJUKCHHE is a software engineer. He previously worked as the tech lead of Karkhana, an education-based maker space and company in Kathmandu, Nepal that designs learning experiences for kids using STEAM curriculum and practical methods. There they usually work with open software and open hardware solutions, such as Arduino. "I was working as an educator in Karkhana, and I started tinkering, experimenting with open science hardware, teaching students how we could use them to solve real-world problems. That's how I got into the open source part of the world", he says. "Also two friends of mine who worked with me at Karkhana went to previous GOSH events: Suresh Ghimire was at the first one, in CERN (Geneva, Switzerland), in 2016, and Aakriti Thapa was in GOSH 2017, in Santiago (Chile). That's how I found out about GOSH, and I started engaging with the GOSH community. In 2018, I went to the third gathering, in Shenzhen".

One year later, in December 2019, Prayush and Surya Gyawali (Teacher/Product owner) put up a small GOSH regional meeting in Kathmandu. The call-out said: "Karkhana has been participating in GOSH since 2016 and most of our classes are based on open-source hardware and software. To share what we have learned at GOSH, we would like to organize a regional GOSH here in Kathmandu, Nepal, focusing mostly on STEAM (Science, Technology, Engineering, Arts, and Maths) education".

SPREADING THE WORD

The main challenge for Prayush and Surya was recruiting attendees. "The gathering was a little bit hard to organise because not many people knew about what open science hardware actually is, so it was hard to get people involved", remembers Prayush. "The first thing we did was post an announcement on the GOSH forum. Then we used Karkhana's Facebook account as a social medium through which we tried gathering people. We spread around a form. The next thing was to personally call people to join the gathering, that's how we got people to join in". There finally were ten participants, mostly educators and students, all from Nepal.

The second challenge was how to set an agenda. "Since we only had a few people who did know what open science hardware was, we did not know what we should be doing in that gathering. So we made an agenda of sharing with the attendees what exactly open science hardware is. We ended up carrying on sessions about how open science hardware can be used in classrooms, because most of the participants there were still students



“FOCUSED ON EDUCATION”

or educators”, remembers Prayush. Still, there was a more experienced participant: one of them was actually working with a biomedical lab, microscopes and open source platforms. “He was an engineer working with students. He had brought the plans that he was using to develop the open source microscope, and shared them all”, he recalls. “So that was actually available for all the participants during the summit”.

During the gathering, Prayush and Surya ended up creating a few courses on open science hardware and open hardware for educators. “For example, we used Arduinos: with all of them having a single code written to them. The Arduino would take three different inputs and had four different outputs. Depending on what input was given the output would change. Now, changing the things that you add to the board could change what you could make using the same Arduino. So that’s how we were more focused on education”, he said.

The gathering was structured with two sessions on each of the four days, one in the morning and one in the early afternoon. “We started around 10 and we would end around two to three PM. That way, many people would not have to give up too much of their time as well and we were having two sessions per day, so each session would be different from the other. We had some informatics sessions, some hands-on sessions such as digital fabrication with a 3D printer . And the other one was discussions. We even had stacks of boxes of LEGOs that we provided to explore during the discussion. At the end of the fourth day, we had a small exhibition based on what the attendees learned and created throughout the gathering”, he says.

Attending the gathering was free, but the organisers couldn’t afford attendees travel expenses. “We did not have much of a budget. We just did a small scale event including only people within Nepal, who were all able to come to Kathmandu on their own”, says Prayush. “Since most of the participants were living in Kathmandu, we didn’t have to pay for the hotels and travel. We just provided lunch and snacks for them. If we however would have had a budget, we were planning on doing an international event, so that we could accommodate more diverse people from all around the world”.

Reflecting on the whole experience, Prayush sums up: “The event was an opportunity to start spreading around what GOSH actually is, since it’s really hard to find in Nepal people knowing what open science hardware is. Even though a lot of people may be working with technology, and they may be using open source material, they would not know what open science hardware actually is, nor what GOSH is. So it was really good for us to spread the word”.

PIERRE PADILLA HUAMANTINCO

Co-Coordinator at Health Innovation Lab from Institute of Tropical Medicine "Alexander von Humboldt"
Universidad Peruana Cayetano Heredia
Perú

Pierre Padilla Huamantinco is a lecturer and researcher at the Department of Engineering from Universidad Peruana Cayetano Heredia. With a background in Electronics Engineering and Biomedical Informatics in Global Health, he is co-coordinator at Health Innovation Lab from Institute of Tropical Medicine "Alexander von Humboldt''. As a biohacking and DIY Bio enthusiast, he is the director of Biomakers Lab and the Peru coordinator of Syntechbio, a network of biohacker spaces in Latin America and The Caribbean.

Pierre collaborated with Andrés Ochoa in DIY Biology and open science biomedical hardware. He told him about the first TecnoX meeting, a regional interdisciplinary initiative to promote open and regionally appropriate technologies that started in Argentina in 2016, driven by Alejandro Nadra and Ignacio Sanchez. Through TecnoX he met the nascent Latin American biohacker community. The following year, Pierre attended the second GOSH meeting, in Santiago (Chile), where he shared the Gorgas project, an open source GPS tracker. In 2018, he participated in the third GOSH meeting, in China. With the Latin American GOSH community and TecnoX, he was part of the writing team of the GOSH residencies proposal (reGOSH).

REGOSH, RESIDENCIES FOR LATIN AMERICA

"During TecnoX 2018, in Valparaíso (Chile), we started drafting a proposal to organise a program of residencies decentralised in nodes, where each year one country would receive people, in order to stimulate thematic networks that help strengthen the current initiatives in the region, exchange knowledge and create and reinforce local and regional capacities," explains Pierre. The proposal was submitted to the Ibero-American Programme for Science and Technology Development (CYTED) in the category of open science, and won a three-year funding to establish a Latin American network of open technologies. "This allowed us to afford mobility expenses, so that each network node could send two representatives to the residency," explains Pierre.

The first residency took place in 2019 in Porto Alegre, Brazil. The second was planned for March 2020 at the Universidad Peruana Cayetano Heredia Lima, Peru. "I formed the organising team for the activities with students, teachers and researchers from the university. My work in the first stage was to organise meetings to consolidate some of the country's own guidelines, to reflect the needs of our context and, based on that, to propose

"BUILD AND STRENGTHEN REGIONAL NETWORKS"

specific topics for the residency," explains Pierre. "We proposed to work in biomedicine, around communicable diseases, to develop diagnostic tools or low-cost instruments that could complement health centers that might need equipment. Public health was our driving force. I have been able to perceive some gaps in the Peruvian health system, and in some other countries in the region as well: care and capacities tend to be in urban areas, centralized in the capital. So we wanted, within the framework of this residency, to be able to work on open science hardware projects: flexible, modifiable, scalable hardware that can be used according to the interests of the user who wants to replicate them".

COVID-19 changed the plans, so they had to rethink the activities and make them remote. Pierre led the organisation of a series of talks promoting open science hardware, in coordination with representatives of the other six nodes. "Part of my day-to-day work is to show that open science hardware is one more option among the many that exist today, in this case for students," he summarizes. Now they are facing how to set up a residency remotely. "Perhaps with a virtual workshop, and then we'll see which solutions are viable to implement in each node: perhaps they can access inputs and develop distributed work. We had to bet on digital platforms".

DIVERSITY

"One of the features of GOSH is diversity. There is an exhaustive search for representatives from different communities so that they can have a voice in the meeting, to share, to learn and to discuss," Pierre emphasises. "And the other key feature is the spaces that are generated, in different modalities, where each of its members can contribute from their experience, no matter what their background is. Non-academic knowledge is not invalidated, such as indigenous ancestral knowledge, which comes from a process different from that of science," he highlights. "It helps to have formats that don't just stay at the pencil and paper level, but also involve getting your hands dirty. The combination of unconferences, hands-on workshops and keynotes allows us to express ourselves, share, learn and create new networks and links, which are increasingly important," he says. "All this is framed in the values of GOSH, which can be seen in the Manifesto and the Roadmap: everything is already framed in a global community, but it's about finding a balance to align it with local interests and needs in each place."

The reGOSH team sought to maintain these values of diversity. "Sometimes this is neglected, and there are no non-urban or non-capital city people at the events. Avoiding this requires a lot of work, contemplating different profiles in the working groups. The most coherent thing to do is to invite people who can be bridges with these other areas to co-organise, so that the movement and the effort is decentralised," he says. "It is a constant effort to try to identify these people, establish and maintain these links; for example, we relate to independent groups that use open hardware for education in Cusco and Arequipa. We thought about doing the residency outside Lima, but the challenge is in resources and facilities, because even though we are seeking to decentralise, only in Lima do we count on the university."

TAKING SOMETHING HOME

"Another enriching element of GOSH is the documentation, which is information generated that remains for future members of the community and is useful to learn," says Pierre. "It also generates in the participants a certain anxiety of wanting to participate in everything, and a fear of missing out on something. For us it was quite exciting to have that range of options to be able to learn something new, to return to our country with something that we can potentially apply in what we do in day-to-day life."

PAULA PIN

Pechblenda Lab
Spain

Paula Pin is an artist and a biohacker. She studied Fine Arts, and while producing performances she began to incorporate sensors, elements related to haptics and science fiction. She has undertaken residencies in experimental art and tech production centres such as Hangar in Barcelona, Summer Lab in Gijón and Interactivos at Medialab-Prado, in Madrid, among others. "I've always had a very strong connection with free technologies. From Hangar I got to know the contexts of free technologies in Barcelona: I had already fallen into the pot. I really liked building sensors and spending hours reading papers," Paula says. "I was generating the intersection of technological hacking with gender collectives. That's where transhackfeminism in the Iberian peninsula came from, also in contact with the ecosex movement of Beth Stephens and Annie Sprinkle. In retrospect, biohacking emerged in 2010 in Medialab-Prado. I had been interested in visuals for a long time. I had been in a group with Maria Mitsopolu, Transnoise, where we worked with noise and transgender performance, as well as with non binary corporealities: building other bodies with recycled rubbish, dealing with the ideas of cyborg, of the organic and the inorganic, in processes of collective creation", she recalls.

"I won a bio-art prize, Vida, with what I called at that time Photosynthetica "expanded performance": a bit outside of anthropocentrism, I proposed to expand the body and their interactions with the ecosystem through sensors," she says. "I had a connection with plants, with data, and so I was very interested in photosynthesis. Through a lot of research into photosynthesis, in 2012 I ended up meeting Andy Gracie and Marc Dusseiller, from Hackteria. In 2013 we started organising workshops together. In 2014 we put up one for 200 people in Indonesia".

At that time Paula lived in Calafou, a community in Catalonia that defines itself as a post-capitalist eco-industrial colony and promotes the use of free and open technologies. "The hackmeeting was there", she says. "At the beginning it was quite computer-based. In 2012 we integrated a microscope to look at the river and find out why the water smelled bad. I put up a transdisciplinary bioelectrochemistry open lab called Pechblenda, because that had fascinated me while working with plants and bodies: identifying what it's like to be in the ecosystem. And also, I was concerned about repairing, and trying to make sure that there were many of us doing so. We are not going to save the planet, but we can

"THE LABORATORY AS A NETWORK OF AFFECTIVE CONNECTIONS"

make small repairs", she states. "With that illusion, the desire emerged and this lab was born. It was also a collective space, an expanded hack, because we were working with appropriate technologies: the sensors were very nice, but we needed a heater. It was a time of full-on experimentation on laboratories of the commons, in a place that was a ruin, where everything was to be done", she sums up.

DIWO BIOTRANSLAB

Through Marc Dusseiller and Urs Gaudenz, Paula was part of GOSH 2018 in Shenzhen, with a mobile DIY transfeminist gynecology lab. In her session she taught people with vaginas how to handle speculums to get a quick HPV test using vinegar. Some of the participants' vaginal cells were checked under DIWO microscopes. "These are sensitive issues for people who are not in contact with transfeminist contexts. It's socialising information that I already have naturalised very much. I look for ways to make it understandable for everyone. There is a lot of translation work there", she says. "One of the things I've done the most is translating science, making it more chewable. I'm a trans-sister, a transducer of information. There was a moment when I got very emotional, I had to leave the room for a second, because the participants took the floor, they told of their experiences at the gynaecologist's, a discourse that was repeated in different places... We could see that everything that happens with the body is not so open".

THE BODY, OPEN HARDWARE

"In GOSH I tried to talk about the body as open hardware," Paula explains. "I did it to decolonise a science that can be considered heteropatriarchal and reductionist. We are here to bridge the gap of access to technologies, so that science integrates all identities. It is a matter of bringing other visions together, from a feminine point of view of science, like Lynn Margulis' vision of endosymbiotic theory, of cooperative action: that we evolve if we share. How to make all these voices present in the discourse, and not be mere replicants of the system we already have. I wanted to de-normalise and de-binarise, to speak from all those voices, to queerise the code a little, to make noise with the whole scale of greys and dissonances".

Paula reflects: "Why do we develop machines? Either because they don't exist, or because they are privatised, expensive and difficult to access. Open and free technologies allow us to broaden access to them and to be creators of our technologies, rather than mere consumers. From a pedagogical point of view, making, documenting, distributing and sharing are the reasons why a space like GOSH exists. It is about being able to understand how things work from a shared, transversal, horizontal knowledge, and for the greatest diversity of people to have access to it. It would be key to be able to develop this in schools, in free education, and to be able to generate our own tools," she enthuses. "The idea is thinking about what we want to do, what we need and want to build together. It's always nice and fun to be able to discover how things work, to share it, to build. It generates excitement, people get affected by being there".

"I work in transdisciplinarity. I understand the laboratory as a relational aesthetic, beyond hacktivism or performance", Paula rounds off. "The idea of the laboratory of the commons is hyper-relational: the feelings, the affections, the networks that are generated are more important than the piece of hardware that is made there. What is generated is already an entity, it has its own presence in that network of affective connections between the material, the personal, the physical, the tangible and the intangible".

MAX LIBOIRON

Director, Civic Laboratory for Environmental
Action Research (CLEAR)
Associate Professor in Geography, Memorial University
Canada



Max Liboiron is a leader in developing and promoting anticolonial research methods. As founder and director of CLEAR, an interdisciplinary plastic pollution laboratory whose methods foreground humility and good land relations, Liboiron has influenced Canadian national policy, invented technologies and protocols, and led the development of the interdisciplinary field of discard studies. On that journey, they create open science hardware specifically for marine plastic pollution monitoring in northern climates and economies. They worked on the writing of the GOSH Manifesto, Code of Conduct, and Roadmap. Several GOSH members highlighted their role in making GOSH a diverse, safe, and participatory space.

"When I saw the call for the first GOSH I assumed it wasn't for me, that it was another male-dominated, white-dominated, dude-core situation'. But Shannon Dosemagen individually invited me, and told me that I did fit. For folks who are underrepresented, direct invitations from someone they trust is the key recruitment strategy", they say. "The meeting had a good spirit and intentions but it was still very dominated by what's called 'dude-core culture' in tech. Also it privileged certain types of open science: high-tech, multi-tech things that beep. As I design hardware to be done without electricity because that's the communities I work with, I thought 'this is not for me'," they remember. "But there was a bunch of feedback of that kind from the first GOSH, and the organisers decided to address it. For the second GOSH, I was part of the organising team and we made a real effort to deal with that alienation and dude-core culture. I volunteered to do equitable and anti-oppressive facilitation. They invited me as someone who is fluent in these techniques, because intention doesn't do it: you need to have plans that you know work. So we tried to change a lot of things. The most and first important thing to ensure equity and diversity is ensuring that you have experts in diversity on the organising committee".

HOW TO RECRUIT DIVERSE PARTICIPANTS

"For selection, we set quotas and targets, which took a lot of discussion. Research shows that having diverse people, however you want to define that, in a conversation requires they make up more than a third, or they will simply not speak. If they don't make up half or more of the group, then they won't get innovative. They will only enrich and educate the rest of the group. So our goal was to make sure we had over 30% or over 50% in groups that tend to

"NOTHING ABOUT US WITHOUT US"

not talk as much in these conversations: global south or low income countries, gender diversity, artists, and people from NGOs. And of course, local people, because having a meeting in people's homes without inviting them is super colonial and rude", they explain. "Setting targets was really hard, but meeting them was even harder, because people from these diverse groups know that most meetings aren't for us. So putting out an open call doesn't work, because they won't apply. You have to demonstrate the culture you preach. We tried to do that by talking about the targets in the call, and through a lot of targeted and snowballing invitations. We wanted folks who would change the conversation. There was a lot of conflict between merit-based evaluation and equity. The problem with merit-based evaluation is that it assumes evaluators already know the terms for excellence and they map onto the existing ones, when often what you're trying to do when you diversify is to change what excellent looks like", they state.

HOW TO MAKE A SAFE SPACE

"The second biggest issue is retention and safety. Just because you've managed to get people in the room doesn't mean they stay or that it's a good space for them to be in", explains Max. "So we created a Code of Conduct with accountability. We had people who looked out for the Code of Conduct and that's all they did during the meeting, they didn't multitask. If there was an issue, you could talk to them or send them something anonymously and they would just take care of it. And that can't be someone who is also running the meeting".

ON FACILITATION

"We tried to move the culture away from leadership and towards facilitation: how to get people to put everyone's ideas on the table and invest in other people, instead of investing in themselves, in their own good ideas, which is more common in individualist cultures. There are techniques to do anti-oppressive facilitation, such as the AORTA collective guidelines. We made four or five guidelines and put them up everywhere on posters, and we did training. Things like 'ask more questions than you make statements', 'step back if you've spoken a lot', and 'if someone hasn't spoken, put them forward.' One of the most important yet simple facilitation techniques is the round robin, where you go around the circle and everyone talks, or they just say 'pass' if they don't want to speak. That revolutionises the conversation. You hear from people who tend not to speak as much and when there's agreement, you hear it", they say.

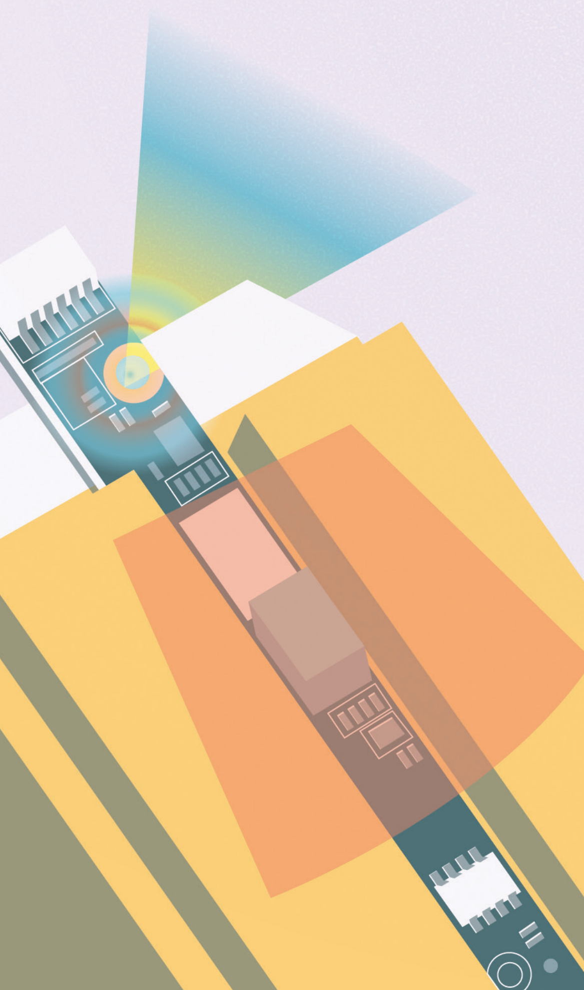
"Having someone in each group who is a dedicated facilitator, especially in hard conversations, is really important. That was my job: getting other people's ideas onto the table, without adding my own. I was active in the Roadmap conversations, which had 112 people. That's why you need training: 20 of them will talk a lot, and the facilitator's job is to get to the others. That takes a lot of work, and the facilitator needs actual breaks. I was pretty burnt out by the end."

IMPROVING

"Almost everything was in English. Paying more attention to translation and multi-language facilitators, and also to disability and child care, would add a lot of value for equity", says Max. They add: "I think a good policy is 'nothing about us without us'. If you're going to talk about tech for Indigenous people, for example, have at least 30% Indigenous people there. The assumption is that if you have a diverse group they'll be good at all sorts of different diverse conversations, but that is not always true."

MARINA DE FREITAS

Centro de Tecnologia Acadêmica
Instituto de Física, Universidade
Federal do Rio Grande do Sul
Brazil



“What's so strong about GOSH is that it's focused on conversations, and in those conversations every person is important”, says Marina de Freitas. “We are used to being just an audience. In a regular conference, if you are lucky, you can ask a question. Nowadays a round table is usually a collection of short talks; people discuss less and less. Not in GOSH: all the people in the gathering can propose and make things, everyone is heard. And the more diverse the groups are, the more constructive the conversations”.

Marina is a physical engineer who works at CTA, Centro de Tecnologia Acadêmica (Center of Academic Technology), an open science hardware lab at the Federal University of Rio Grande do Sul, in Brazil. She has been part of the GOSH Community since 2017, and since 2019 she is in the organising committee of reGOSH, a residence programme for Latin America.

“While I studied for my degree, I couldn't see how my profession could contribute to social transformation. Then I learnt about the free and open source movement, and I thought it could be a way to use my studies for something more than my economic benefit”, she says. At CTA she met Rafael Pezzi, an open science hardware pioneer. He was part of the first GOSH meeting, at CERN, in 2016. Back in Brazil, he encouraged Marina to attend the second gathering, in Santiago de Chile, in 2017.

A MORE DIVERSE TEAM TO REACH A DIVERSE AUDIENCE

“That meeting changed my life”, she recalls. “I saw a lot of things for the first time: a very wide, real diversity. I interacted with people that I don't usually meet in academic spaces, such as activists and artists. Also, there was a significant number of trans people, I had never seen trans people at scientific events. They were there because they knew they could talk and that they would be heard”, she remarks. “And I found a diversity of approaches: academia and first-line science and innovation, but also start-ups and community science people. Very cool.”

“Before GOSH, in open hardware events I contribute to organise, usually there was only one trans person, one LGBT+ person, one black woman... I was the only woman and the only LGBT+ person in the organising team, so ensuring diversity was on me. It was very hard to get representation. You need a more diverse organising team to reach a diverse audience and meeting. For instance, you must think about things like neutral gender toilets... if you only have one person with an eye on diversity, it is very hard to keep all the aspects in mind. It takes the whole team to make it right”.

"YOU HAVE TO SHOW THAT EVERYONE CAN PROPOSE AND MAKE THINGS"

REGOSH RESIDENCIES

The reGOSH residences have the purpose of building, strengthening and connecting the seven nodes of Latin America OSH community: Porto Alegre (Brazil), Buenos Aires and Mendoza (Argentina), Santiago (Chile), Lima (Perú), Quito (Ecuador) and Bogotá (Colombia). Each node selects two people to attend the residence. For two or three weeks each year, they all work together on open science hardware projects, in a different city. The programme started in 2019, in the CTA, where Marina was the main local organiser.

The first reGOSH was very challenging. "The goal was to get people physically together to develop technologies. Nothing was pre-defined, so some people wouldn't come because they didn't know what they would do. The projects were decided on the first days. We had to look for the materials on the go, and we only had financial resources for travel expenses, not for stuff. We learnt that for the development of technology, this improvisation wasn't ideal", explains Marina.

Working on a volunteer base is also an art. "Sometimes people don't answer because they don't have the time. So, it's good to design a system to be able to hear everyone's words, but also to make decisions in smaller groups, or even individually, when the rest of the group can't do it", says Marina. "In reGOSH we had a lot of logistic decisions to make. It's good to clarify the process, to know who has the autonomy to move the work forward".

These challenges were solved with a great amount of goodwill. "We all wanted to hear and collaborate", remembers Marina. "The participants felt that reGOSH wasn't about the organisation giving them something; everyone could make decisions, change the space, take what they need. I guess that happened because we were open, sincere. And also because we showed them that they could act, we gave them possibilities". The first activity was learning to use Git through an imaginary project, with playdough and broken electric components. "We made groups of three people from different nodes, who had never met before, and asked them to work on a dream project: no worries about reality", explains Marina. "It was very good, and important, I think". By the end of the residence, the open hardware projects could not be delivered, but instead, there were other results. "It's hard to make nice open hardware in such a short time. But the main goal was to build community. Some nodes were really strengthened: a lab was created in Buenos Aires, and two people from Porto Alegre traveled to help consolidate it."

The next residence was meant to be in Lima in March 2020, but it had to be cancelled because of COVID-19. "We needed digital infrastructure", says Marina. "A website, a file repository. We worked on that". Also, monthly online events on OSH projects called Circuito reGOSH were organised in Latin America.

Reflecting on the experience, she says: "The challenge of organising a GOSH event is to find a balance between ensuring something cool and letting things be. You have to trust the people and accept that maybe it's not going to be what you imagined. Doing with others is a very organic thing: if you try to structure and control things very much it gets harder, and, on the other hand, if it's too unorganised, the event could simply never happen. You have to find that magic balance".

MARC DUSSEILLER

Global Hackteria Network
Switzerland

Marc Dusseiller is a transdisciplinary scholar/ lecturer for micro-and nanotechnology, cultural facilitator, educator and artist. He performs DIY workshops in lo-fi electronics, hardware hacking for citizen science and DIY microscopy. He co-founded the Swiss Mechatronic Art Societyin 2006, and started with open hardware and DIY electronics workshops. Soon he also organised other events blending art, music, technology and open source software and hardware. “We did a lot of social work with the local youth centers when the maker movement started, with our roots in electronic music”, he remembers. “I figured out that I was happier working with people than just with materials, sitting in a lab. I’ve been bringing people from different backgrounds together for 15 years and I really enjoy it”.

In 2008, he brought his maker skills to his students. “I started teaching projects on nanotechnology and microfluidics using the open source approach. The bachelor grade students had to build their own nanotechnology laboratory equipment in one semester, using open hardware. People were building pumps out of Lego”, he laughs. He attended media art festivals and started to define himself as a workshopologist: “I’m very much into physical interaction, learning environments and also informal settings like hackerspaces”, he explains. In 2009, he participated in Interactivos - Garage Science, a workshop in Media-Lab Prado, a citizen lab in Madrid (Spain). There he met people with whom he founded Hackteria, a global network in the field of Open Source Biological Art. They started to work in Indonesia and India, establishing long-term collaborations. “What we developed as a teaching and creative output had some other real-world implications there”, he says. “We aimed to empower people to do their own stuff without having to buy expensive equipment from the West, and increase the quality of education”.

When the first GOSH meeting was set to happen in Geneva, he joined the organising team. “We had been in the loop, organising hackathons and workshops, for a long time. We were both local contributors, and connected globally with the network that Hackteria already had established”.

MEET ON OTHER CHANNELS

“GOSH is really global and transdisciplinary, going beyond researchers and hardware developers to involve artists, activists, freaks. I believe that bringing people from different cultural, educational and financial backgrounds together, playing and consuming music together, makes us humans”, says Marc. “Music creates another level of interaction. By improvised music sessions, we have established very

"A WORKSHOP IS PLAYGROUND FOR HUMAN INTERACTION"

interesting non-verbal communication and collaborative environments. Through music and dance, we can meet on other channels that we all appreciate as humans, and allow us to leave prejudices behind".

"Hospitality is the art of making people feel comfortable. It is only achieved by authenticity, being yourself, behaving in the same way as you would do if you had your neighbors coming over for dinner", he says. "Local hosts shouldn't be some kind of image of international neutrality. It's interesting to run into something that you haven't expected, not the same Hilton-like event. Each event is fundamentally different through the individuals that are organising and hosting it", he remarks. "There are also other very different incentives than those existing in academia. In the underground culture networks, you make up for the lack of funding by being nice to the people. You just make sure they're happy and have a nice place to stay and maybe meet some interesting friends. I think bringing this private touch and your own style and authenticity make the event better, and if there is a group of people involved from different backgrounds, it makes it full of surprises", he highlights.

"During the first GOSH, the participants themselves cooked for the whole group, linked to the hospitality idea, as well as saving our funds for other things", recalls Marc. "Cooking suddenly makes us all human, and we have discussions in the kitchen that are not so much influenced by our disciplinary backgrounds but just our human backgrounds. We all can chop onions together, and we all enjoy food, we have recipes to share. I think the whole sharing recipes and cooking together is a bit of a metaphor for the open science hardware: it's about sharing, having different influences, recipes, instructions on how to make things."

THE META LEVEL INTERACTION

"There are always two goals in a workshop. One is learning through making some objects, and the other is the meta-goal: having a hands-on practice in a large group might lead to a human-human interaction across disciplines and cultures. These goals fertilise each other. The practical hands-on workshops are extremely fruitful as a safe little zone where people do something with their hands and sit next to each other for a couple of hours. It's kind of an icebreaker, a playground for interaction. Some people feel more comfortable if they have something in their hands, and not so comfortable if they're in a circle where they have to voice out their opinion. In the hardware community, people focus far too much on the technical aspects of a workshop and not so much on this meta-level interaction that the workshop itself enables. Building a device? I can do it at home watching YouTube", he emphasises. "Also I think in many workshops in the maker and hardware environments they say that you learn something, but instead you only follow a strict instruction. In my opinion as an educator you have learned nothing, and this "obedience" is not the society I want to live in."

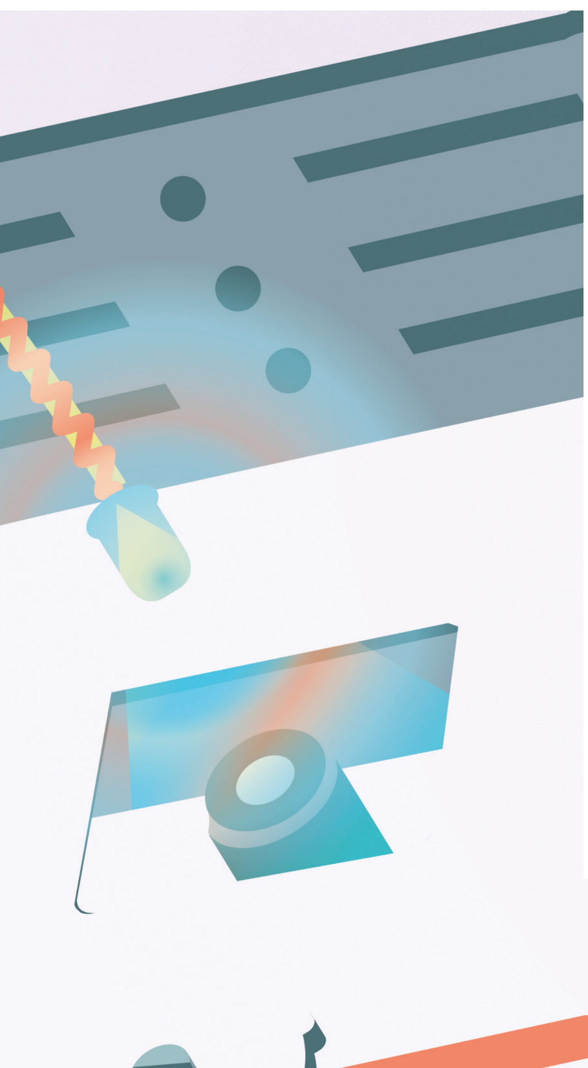
RADICAL TRANSDISCIPLINARITY

"For unconferencing and workgroup sessions, it's great to have experienced facilitators", says Marc. "If a team doesn't have the skill, it's good to bring someone in specifically for that. Being a good facilitator is something that's not so easy, it needs a lot of skill and years of experience. It's not something that you can do according to protocol."

Those techniques are useful to deal with what Marc calls "radical transdisciplinarity". "I think as we are embracing the grand challenges of our society, a lot of us are motivated to tackle the big problems we have in education, in health, in poverty reduction. We can only do it by a radical transdisciplinary approach."

LAURA OLALDE

Artist
Argentina



Laura is a visual artist who blends science, art and technology. She won several grants and awards, and did a residency at Medialab-Prado (Madrid) that widened her experience in co-production across disciplines. Since 2012, she has incorporated bioart practices to her work, working with bioluminescent microorganisms. In 2013 she was invited to attend the postgraduate course of Synthetic Biology at the University of Buenos Aires, where she joined together with molecular biologists and social scientists in a sci-art collective called PROTEUS. As an outcome of this exchange she performed a thesis based on sci-art coproduction for her Master's Degree in Electronic Arts. After that she went in depth about the open source movement. Following that path, she met the Hackteria Global Network for bio artists. It was through a post by one of its founders, Marc Dusseiller, that Laura first knew about GOSH. "I read the Manifesto and I thought: 'this is the way to go'", she remembers. She signed it and applied for the 2017 meeting, where she was selected. "I totally subscribe to the idea of opening the black box and sharing open knowledge," she explains. "I'm interested in interdisciplinarity, or anti-disciplinarity: erasing those borders that sometimes hinder exchange and dialogue, opening up the tools so that the other can understand them and making a commitment to a common language".

ETHICAL

"I got off the plane in Santiago, I went straight to the meeting at the university and I found a large room with people talking in pairs. I said 'wow, so social!', because they were all chatting at 9 AM. It turned out that it was one dynamic of introductions: that's when I loved it", she remembers. She highlights as a GOSH feature "how people with different paths are mixed", and "the fairness of representation, which creates a substantial platform for exchange". Also remarks the ethics: "I like the tempo, how the other's word is respected, how equal participation is encouraged. Everyone is looking for access to open technology for freedom, for education, for equity, for inclusion: it's an ethical issue. In the GOSH community that's a basic agreement".

From that first moment, Laura wanted to collaborate. "I had a good vibe with the community, and so I proposed a photographic record. I like to be a bit behind the scenes, to look at what happens from a different perspective," she says.

WILLINGNESS

From this spontaneous offer, Laura became GOSH's documenter. "At the end of each day, I shared the material. On the last day I worked on editing the report with Juanma

“DOCUMENTATION IS THE LINK FOR THE NEXT GENERATION”

[Juan Manuel García] and Max [Liboiron]”. For the next edition, in Shenzhen (2018), Laura responded to a call on the GOSH forum and took on the role of coordinator of the volunteer documentation team. “This organisation shows this willingness to transfer, to expand knowledge horizontally. I didn’t have to be particularly expert, but I had to be willing, and of course I had to count on the collaboration of a lot of people. There was coordination before the trip, online. Then we arrived in Shenzhen beforehand and held a meeting where everyone said ‘I am more skilled at this, I can collaborate with that…’. There was a lot of willingness. In addition, each session’s organiser was asked to always have someone taking written notes and to immediately write them down in a document. That’s important.”

Laura photographed each of the sessions. “I was in all of them, a little step outside. I felt a great responsibility and at the same time there was some resignation to accomplish the documentation purpose that I chose”, she says.

ACCESS TO INFORMATION

“Documentation is key, because it is access to information. If it is not documented, what happened remains only for those who were able to attend the event. The important thing is that a teacher in a rural area can have access to clear documentation to build a simple microscope with her students,” says Laura. “It is key to establish links with educational communities, so extensive documentation and data transparency is vital. Documentation must be transparent, accessible, simple, editable, on open platforms. That is how the movement grows. Otherwise, GOSH would risk becoming an event that ends up being closed to a few experts who have the privilege of access, and alien to the communities that could benefit from the knowledge that can be derived from opening up technologies”.

This requires a methodology: “Documentation has to be on the spot. There has to be an online repository of every meeting, everything has to be recorded. Without any delay: the record shall be part of the event, the event shall also consist of the record” recommends Laura. “There has to be awareness-raising beforehand, building a consensus on the importance of keeping a record for whoever comes after us. It requires a commitment, and a space and time specifically dedicated to downloading and editing the material at the end of each day. It doesn’t happen magically. In the rush, the day went by, and what you didn’t record is gone with the wind. Afterwards, reconstructing is much more laborious, you have to start looking for bits of records, like a Frankenstein”, she regrets.

“I would publicly ask the whole group, not just the volunteers, what format we want this communication to take, to shape it together,” Laura proposes. “In Shenzhen, Ananda Gabo did a drawn chronicle: wonderful drawings that can transform the record into something else, to condense a lot of things with a few key phrases, like an infographic. That’s why I think we have to propose at the beginning of the event if someone wants to make a drawn chronicle or a storyboard, to generate this pool of wills,” she says.

“We have to prioritise documentation, because it is what remains”, highlights Laura. “It is the link for the next generation: if it is not there, a lot is lost. Because these communities are also built through alternative channels, it’s not that all universities are talking about open science hardware. We have to be aware that our channels cannot decline, we have to nourish them, to generate new ways of producing open knowledge”.

JULIETA ARANCIO

Postdoctoral researcher, University of Bath, UK
Associate researcher, Centre for Research on Transformations (CENIT-UNSAM)
Argentina

JULIETA ARANCIO is a researcher in Science and Technology Studies, an advocate for democratization of science and technology and a mentor for open hardware projects, with a background in Environmental Sciences. She is currently working on a case study of the Open Flexure Microscope project at University of Bath.

Looking for a topic for her PhD in Argentina, she came across open science hardware. “One of my thesis supervisors suggested that I look into open hardware; I had heard about it through discussions in the free software community” says Julieta. “But I was interested in scientific tools. So when I ran into the call for the second GOSH meeting in 2017, I decided to apply; getting selected surprised me, because I didn’t do hardware.”

“It was totally different from what I imagined: it was structured chaos, and everyone seemed to be having a great time. I found it an interesting mix of technical and non technical people, and much more women and gender non-conforming people than any other tech conference. Witnessing the Roadmap discussion was very intense: it was a mix of an assembly, which was familiar to me, with people discussing technology” recalls Julieta. “I took on the role of observer, and thought I would like to study GOSH for my thesis. Soon after I started participating in open hardware projects myself, and I met a lot of people doing my thesis. It was hard for me to familiarise myself with some of the concepts in the beginning; that’s why I always push for new ways to welcome newcomers. Due to the PhD, and writing GOSH history, I managed to meet lots of GOSHers”.

“In 2018 I was invited to be part of the organising team. With Marc [Dusseiller] and Fernán [Federici], we were thinking of a programme that was a call to action, more than just a conference”, says Julieta. “The theme of Shenzhen was ‘scaling up’. For many it was paradoxical, when thinking of ‘Small is beautiful’. That discussion is central and I think was reflected in the panels. It was like a transition for me: a more activist Chilean GOSH, the more maker Chinese GOSH, and a decentralised, regional GOSH in 2019, which seems like the right decision for this different kind of growth,” she adds. “I now focus more on reGOSH, the Latin American community. We organised a residency in 2019 in Brazil, we also promote the discussion about openness in technology policy in Latin America through different activities.”

DIVERSITY

“The organising team has to be diverse. At least five people depending on the size of the event, and always with someone local. In the 2018 team we were very different, that tension was productive”,

“SETTING INFRASTRUCTURES FOR EQUITY”

she remembers. “We have to be very intentional about the diversity quotas established in GOSH, not only in terms of gender or geography, but also in diversity of background, which has a strong impact. There has to be someone insisting on that. And try to spread the call to as dissimilar and unconventional places as possible.”

AGENDA

“The unconference element of the agenda is key. The system has to be very clear, so that everyone knows how it works, to prevent some from taking advantage of it over others. It has to be very clear what the time limit for proposals is, how many people are needed to open a session, and that the agenda is visible to everyone at all times”, states Julieta. “A balance between self-organising and predefined key discussions is central. You build on what happened before, it’s not that you’re making an event out of nothing, you shouldn’t reinvent the wheel. You need someone in the organising team with experience of what’s been going on. In the three events, the link was very clear: the Manifesto as an umbrella of values in the first, the Roadmap taking into account those values in the second, and in the third it was ‘concretely, who is going to do what?’.”

“The balance between discussion sessions and hands-on workshops is very important”, remarks Julieta. “Maybe someone who doesn’t like to talk a lot will be encouraged after participating in a workshop, and someone who is a pure talker will be exposed to the vulnerability of not knowing how to build something. Usually, you know the role you are going to play at a certain event. GOSH throws you off a bit. This relates to the selection of participants, but also with the layout of spaces: they should allow this flexibility”, she says. “And it is key to have a time for engaging with the local community outside GOSH. GOSH is about applying technology and making it useful in different contexts, you have to understand where you are.”

DOCUMENTATION

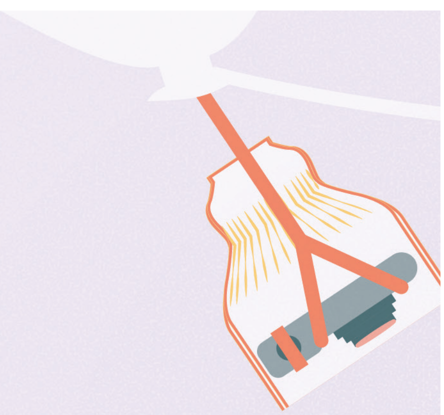
“It is essential to document, to record what was done and discussed, so that everything is somewhere and can be shared, to be able to build on that, and to invite many people who couldn’t be there. You need a team of dedicated people, plan the documentation guidelines, have templates so it’s easier for everyone to fill in. In each session there has to be a person to document, everything can be shared in the forum, allowing discussions to emerge. Media consent is important, some people may not want to be photographed for many different reasons.”

MANAGING DIVERSITY

“A small talk on facilitation and contextualizing the event at the beginning are essential to set the tone. ‘The facilitation training and the code of conduct are there to ensure fairness in participation, documentation, respect for others’. The code of conduct isn’t just a piece of paper, you need the roles to make it work”, says Julieta. “Those are all mechanisms to make the diversity productive. If a disagreement is stated respectfully, and is documented, it can open up alternatives. This is related to feminism as well: setting up the necessary infrastructures to dialogue from different places from a position of equity. It’s a huge work of patience, an attitude: realising that you can disagree, and it’s ok, you can keep building.”

JULIAN STIRLING

Open Flexure Project
Centre for Photonics and Photonic Materials
Department of Physics, University of Bath
United Kingdom



JULIAN STIRLING is a Post-doctoral researcher in physics and has been designing open source hardware for science for years. He is part of the OpenFlexure microscope project, which is increasing access to laboratory-grade robotic microscopes in Africa. His supervisor, Richard Bowman, attended the first two GOSH meetings, and showed the OpenFlexure microscope in Santiago, in 2017. He suggested Julian attend the third GOSH, in Shenzhen. “There I learned what the community was, and I’ve been very actively involved since”, he says. “This was the really interesting thing about GOSH: I hadn’t been in the open hardware space for very long. I’d been passionately open source in terms of software, but I’ve been working at places where people weren’t that interested in making things open, until I I joined the group in Bath in 2018. Maybe six months later I came to Shenzhen, and I instantly felt at home with the GOSH community. Even though I’d known people for a few days, most of them, I just felt that I’d found my home”.

“There’s the ideological perspective: I want to share everything that I do and I’d like other people to share it. GOSH is not only a group of people with the same idea but with a passion for how we push that forward, and for working together to do it. I’m used to talking to people and saying ‘we should do this openly’, and either get greeted by people who say ‘that’s a nice idea in theory’ but they’re not going to do much about it, or find people who think I’m a weird hippie. And maybe I am. But then you got to GOSH and it was a whole community of people that had not only been thinking about this for years but were passionately wanting to make the future that I want to see”, he highlights. “The whole event was not focused around ‘there’s one or two people who have this vision and you’re here to act it out’, but getting everybody to talk about their vision. It was a combination of the fact that everybody listened to you but there was time to make sure that you listened to them, and then we were all pushing in the same direction”.

For his experience convening a session in GOSH 2018, he learnt the value of planning. “We turned up with a microscope and somebody suggested to me we could do a microscopy session. Another person also wanted to do that, so we formed a group, and, somewhat naively, I assumed that we would look at our microscopes, how hard could that be? There was poor facilitation, planning and coordination.

“I FELT I FOUND MY HOME”

People enjoyed themselves, but I think with a bit more planning and a bit more conversation we could do it better, not as two sessions in one”

HAVING A PLAN

In February 2020, he organised the meeting Open Hardware From Academia in the University of Bath. “It was a ‘not GOSH’ event, because it was funded by the university, and less community focused, mostly academic. Also it was less international, mostly UK and Europe. As we had funding for travel and accommodation, it was quite good at getting early career researchers, but it was very hard to get many people from Latin America and Africa, because that would use up our little budget too quickly. So it was less diverse”, he considers. “We didn’t have a quota, nor did anything specific in the call to reach a diverse audience. We put it on the GOSH forum, and the usual suspects showed up. We ended up with about the same number of applicants as spaces, and then it was predominantly white and male. It was my first event, so I didn’t realise these things early enough. If I’m running another, I’ll ask how to do it better to people that have run very diverse events, like GOSH”.

“There’s always a trade-off with how long an event can be in terms of inclusivity”, he says, “if people have commitments they cant’ have a long time”. Reflecting on the event he organised, he regrets that it was too short for some goals. “It probably only needed an extra half an hour, but it was at the end of the day and it wasn’t like GOSH 2018 in Shenzhen, where we could just stay there till midnight if we wanted to. It was a conference center at a hotel, where the manager said ‘your time is up, please leave’. The staff was coming and going, saying ‘it’s cleaning time, come back tomorrow’. We were very lucky in China that we could stay whenever and do whatever we wanted”.

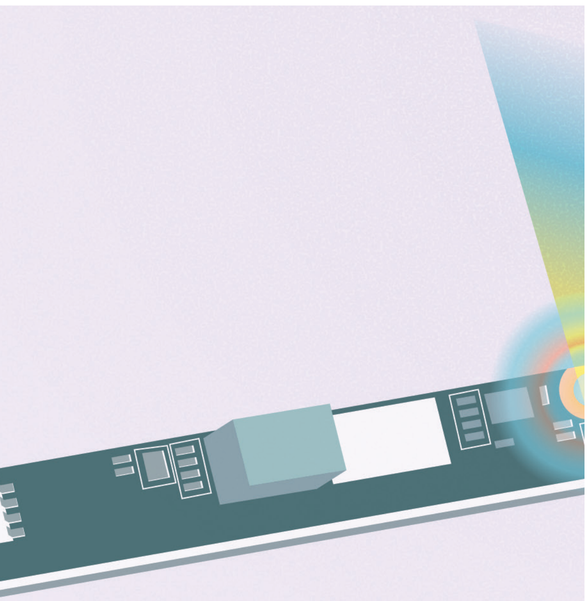
He wishes he would have thought in advance how the conversation would keep going. “The last day we thought about how to move it forward. We could have used the GOSH forum, but some people wanted a mailing list, others created a Gitlab repository, and we ended up doing nothing”, he remembers. “Getting to everyone in the GOSH forum would have been more productive.”

”To make sure that somebody in the organising committee has organised an event before would be a good idea. It was my first event, and also for the four people helping me.

There were lots of things that we didn’t realise would be an issue, a lot of ‘oh no we haven’t’. All of the things that GOSH made look easy, like running an unconference session well facilitated, planning what’s going to happen, making sure everybody feels involved, welcome and talks to each other... If it’s done really well, you just hope it will happen naturally at your own event. And it just takes work to get it going, which takes some planning: making sure you’ve got a good plan for how everyone can be part of the programme, how you’re gonna save the information from the sessions and share them, and how to keep the conversation going... Having a plan, rather than hoping it goes okay. That’s why sharing a toolkit is useful.”

JENNY MOLLOY

Founder and Director of the Open Bioeconomy Lab
GOSH Core Organiser, 2016-2018
Senior Research Associate, Department of Chemical Engineering and Biotechnology, University of Cambridge
United Kingdom



Jenny Molloy is a molecular biologist. As part of the Open Knowledge Foundation, she co-organised the workshop Open Science for Development (South Africa, 2013), where she heard Rafael Pezzi and Denisa Kera on open tools for science. "I was a PhD student working on mosquito control. My colleagues in low and middle-income countries struggled to get what they needed for research. It just struck a chord. I was also highly aware of how expensive everything was in science", she remembers. "I ended up managing programmes on open source tools for Open Plant, a synthetic biology research centre at Cambridge. Open data and open science were becoming more adopted: open science hardware was a slightly unexplored frontier".

By 2015, she had met Greg Austic and François Gray at different conferences. "We'd all been thinking about a similar concept. Somebody said 'we should have a meeting'. Shannon Dosemagen and Marc Dusseiller joined. The vibe came from a combination of our backgrounds: Shannon had experience in community organising and unconferences, François on hackathons and hands-on activities, I'm more academic, Greg had been part of the Open Tech space. We didn't want a standard meeting, but to bring more people together. Later, in 2017, we were fortunate to have Max Liboiron as a co-organiser, thinking very deeply about how to design events with equity at their heart. We benefited from a fairly experienced group that wanted to go beyond the normal scientific meeting."

KEEP THE VIBE GOING

"I think GOSH's vibe is a mixture of people that would never normally be in the same room --artists, scientists, educators, policymakers and more-- together in a way that's not demarcating them as one thing or another, bonding over something that they're all passionate about: open hardware and science. Everybody's trying to recognise what each other brings to the table, with equal value and respect. People usually say they would never have met these other people before, and that they feel they're not in the room as the tokenistic social scientist or artist in a science meeting, but that everybody's bringing themselves and their expertise to the party", she says.

"This vibe needs the right level of structure: enough flexibility that people can make their own niches and activities and conversations happen organically, but enough structure that everybody feels empowered and comfortable to self-organise. At global GOSH the first day is more structured, the second is tightly timetabled, the third is more flexible, and typically the fourth is into the community. Finding the right balance is key to keep the vibe going so that people can engage at their own level. We've always tried to consider people's energy levels and put in plenty of breaks to talk to each other and refresh. Evening entertainment is low-key and not compulsory".

"In 2016 we ended up cooking together, people have repeatedly asked for that in later events. Having something to do with



“PLANNING, PLANNING, PLANNING! ”

your hands while you talk allows people to productively chat in ways that forced corridor conversations at conferences don’t. It’s that idea of informality: there are activities going on, so it always feels like there’s a buzz of stuff happening, but it’s okay if you’re not there. From a planning perspective, you try to maintain the sense of togetherness through the entire event reasonably seamlessly and that requires some logistical planning. For example, how to move people for food in a way that they continue socialising?”

ORGANISING

“We’ve usually split the roles: a group deals with logistics and another does the programming and brings it back to the larger group for feedback. We tried to be extremely thorough. I chronologically follow through the event in my mind. It takes lots of planning, lists, and considering how people will feel at different stages of the event, from first landing in a new city to leaving at the end: do they feel cared for, included and able to participate to the best of their ability? Having at least a couple of experienced people on the organising committee is really useful. To get representative views, the team always had people from different countries, backgrounds and perspectives.”

SHOWTIME

“If you are in charge of logistics, you spend 90 percent of your time running around, making sure that stuff is in the right place and dealing with issues. You try to talk to as many people as possible, to know everybody’s name and introduce them to others. It’s soaking it all in, keeping an eye on the vibe, trying to ensure that everybody feels comfortable and also behaves.

There’s a lot of pre and post-work each day. In the mornings, everything has to be in place, and in the evening you follow up on documentation. You’re always on duty, you can’t really switch off. It’s important to try to get some sleep.

If you’re organising a session, be clear about the audience and the goal when you put it on the unconference programme. One of the challenges with GOSH diversity is that in a group some could be experts and others inexperienced. For practical sessions, think hard about what stuff and time you need. ¡Planning planning! Usually, timing estimations are completely off. People from different backgrounds, chatting, take more time to build something than an engineer. Double the time, contextualise what you’re building, and make sure to explain everything at the start. Be kind, be welcoming and have fun. Even if the session doesn’t happen as planned, you’ll find people with similar goals, and the flexibility of GOSH allows them to continue later, shaping the event how they want to.”

AFTERWORK

“Fortunately, our fiscal sponsor Public Lab did most of the financial paperwork, and Shannon volunteered for evaluation. That’s important and the sooner you send the feedback form, the more likely people are to provide input. It should be ready to go immediately at the end of the event. Then it’s debriefing with the committee what you can improve on, and discuss the evaluation data and follow-ups, as the Manifesto and the Roadmap, where many community members got involved. There’s also reporting and documentation. Community documentation happens quite soon after the event, fortunately in Shenzhen Laura Olalde was running the documentation team. Then we adapt that content to the report for funders: 15 to 20 pages, including photos.

Then the cycle starts again. From the evaluation you’ll know where the next GOSH might be, who wants to go, and who volunteers for organising. There’s a lot to book, and some people would need invitations three months in advance to get visas, so you need to send the call out five to six months before the event. With a twelve-month window, you start planning the next GOSH two to three months after the last.”

DON’T UNDERESTIMATE THE AMOUNT OF WORK

“You can’t plan for everything to go well. If you’re organising international events, mind what is an acceptable time frame in the host country. Be aware that people work at different paces, understand the timing of your team, and keep everybody on the same page.”

GREG AUSTIC

GOSH Core Organiser, 2016-2018
Our-Sci.net
United States

Greg Austic studied economics and sociology, was in the Peace Corps and worked in agriculture in Eastern Europe, always trying to help for a better world. "I realised that you can't just show up and help somewhere, it just doesn't work like that. I thought that making technology better could improve things", he remembers. So he started working in a small biodiesel co-op and ended up developing tech. "The small-scale biodiesel space was super collaborative, DIY and diverse, from hippies to fanatics who thought the world was going to end and people who just didn't want to pay for gas, all connecting around the idea of energy independence. We developed a technology and wanted to get it into the world, and the answer was: 'you have to patent it'. The path was patent, protect, profit, and it didn't feel right, because we had been working as a community. In 2009, no one knew how to open source biodiesel technology at that scale. We had to patent it and it totally sucked". That turned him into an open technology advocate. "I found that the fundamental problem was not a lack of technology, but producing technology which fails to have an impact."

In 2012 he attended an open science conference in California and met Jenny Molloy: they both happened to be couchsurfing with the same host. Two years later, they met again at the Mozilla Fest. "I was feeling that there were a bunch of people working on open science hardware. I thought, 'we need a conference to connect'. I had no broader vision than that. So I talked to Adam Wolf, the founder of Arable, and to Jenny, who said 'I'm thinking about the same thing'. And then we met François [Grey]. He had the tools to do it right, because he ran a lot of conferences and had thoughts and connections and noted similar conversations with Shannon [Dosemagen]. Then we connected with Marc [Dusseiller], who came in a little bit later, bringing in a lot of the organisational support".

COMMON VISION AND VALUES

"I think GOSH's vibe comes from the process that we went through. Establishing strong personal connections is priority number one. Everything else you can do later on, but if you don't establish strong personal connections people just don't care that much. We all have lots of things to do, we're not going to sit in a three-hour meeting unless I really want you to be successful because I care about us. That's what GOSH is about: building those components to help people connect", states Greg.

"IT'S ABOUT BUILDING STRONG PERSONAL CONNECTIONS"

He adds: "The second point is creating a common vision and value statement. That process was key. The comment we get most often is 'I've never been to a conference with this particular set of people and I really like it, it's a very diverse and unique group'. But that was emergent from values. In the first year we didn't have an explicit value set in the conference itself. Then we worked on a common vision, the Manifesto, and we set the goal in the Roadmap. So I think that process is what is unique." Those values could be revised. "I see the global gatherings as the space to look at what we're doing and update it in its entirety, including values. I think that should be a unique and separate event. Then the local events can be a lot more specific. It's important to be explicit about the goal of each event, because people will show up with different expectations and you want to make sure these expectations are met"..

ON PARTICIPATION

One key thing Greg highlights to ensure participation and openness is looking for real diversity during the selection process. "It's not only having demographic or gender diversity quotas. We said: in that 50 percent we want maximum diversity across what they do, and we looked into individual details. It took four weeks just to walk through the participants, a big amount of thought and effort. We shouldn't automate that."

How to hear all the voices? "Something critical is making sure that everybody interacts with everybody else at least once. We did 'round robins' at the beginning where everyone had a moment to speak. They were exhausting but really important. The rest emerges from the values, like there should not be very much of someone talking in front of everybody", he says. "You need trained facilitators. You want to make sure both that people feel heard, and that everyone else actually heard them. If someone makes a long statement, a really good facilitator can restate it, translate it into an efficient statement. The other thing is making sure everybody in the group has the opportunity to be engaged, to give space every couple of minutes. If it's two people going back and forth a lot and everybody else is a little bored or confused, you go: 'does anybody else have thoughts on this?' Your job is to both make the flow of conversation more efficient but also interrupt it when needed. Those two things can get you a long way."

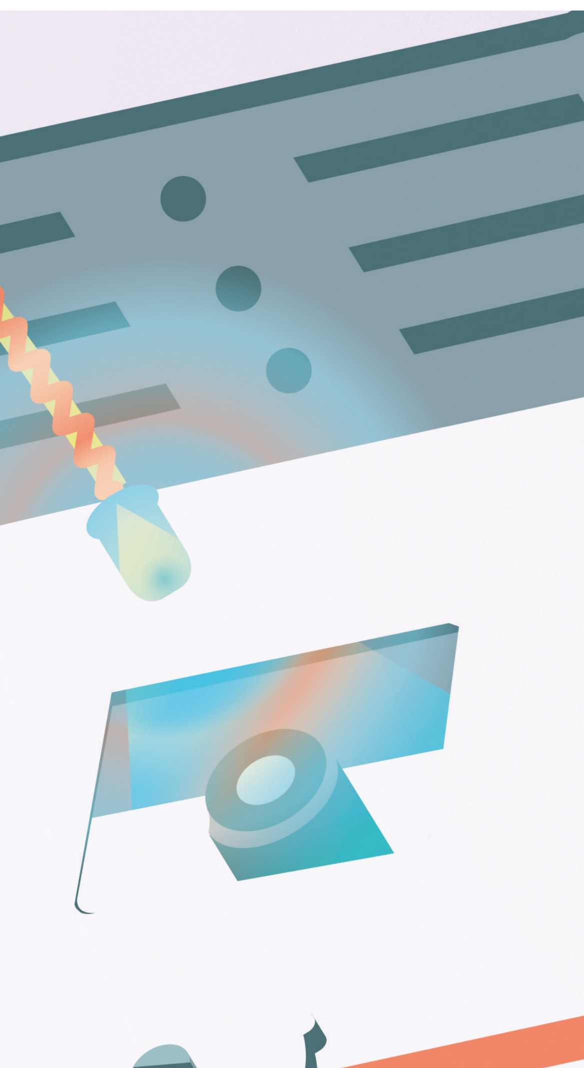
The unconference structure is key. "The funny thing about an unconference is that it actually requires a lot more work than a normal conference. Don't think that you show up and everything happens magically. Actually, you need to be quite specific. There's a process of identifying interests, then merging them into topic areas, and creating sessions out of that. The process itself has value in everybody understanding what everybody else actually wants", he explains. He advises: "Groups shouldn't be too big. You can't expect to have a discussion about a complex topic with 10 people. Don't try, just split it, you will have a better experience".

FEEDBACK

"Part of what GOSH is, is this continuation of progress towards our common goal. So it's really important that we contribute back, so everybody knows the progress made", states Greg. "If you worked on three things of the roadmap, you should post them in the forum, close-out issues or create new ones, for transparency. It's really important to get people engaged in the forum, which ultimately is the long-term thread".

GAMELI ADZAHO

Africa Regional Manager at Just One Giant Lab (JOGL)
Steering Committee Member of Africa Open Science & Hardware
Lead of Global Lab Network



With a background in biochemistry, environment and health, Gameli Adzaho is a researcher, educator and community leader. He leads the Africa programme at Just One Giant Lab, a distributed innovation lab, and curates the Global Lab Network, a community of STEM for social impact. As a researcher, he is focused on the potential of open science and the maker culture in fostering transformations towards Sustainable Development Goals. He is also a member of the Steering Committee of Africa Open Science & Hardware, which put up the Africa OSH Summit (2018 and 2019).

Ten years ago, as he taught science, he discovered the do-it-yourself bio and Biolabs movement. Later, studying at the University of Exeter (UK), he ran into air quality sensors, environmental monitoring and citizen and community science. "I thought it could be a good way to bridge the gap between science and society", he remembers.

While affiliated at the Berkman Center for Internet and Society at Harvard University, he read in the mailing list about the second Gathering of Open Science Hardware, in Santiago (Chile). "I was trying to join, but I couldn't. My friend Jorge Appiah, who was setting up one of the first maker spaces in Ghana, participated and shared a lot of information about his experience there. I thought: 'this is the path to go'. A couple of months later, another friend and mentor, Connie Chow, connected me to Thomas [Mboa], who she met together with Jorge at the Global Community BioSummit (hosted at MIT). They were beginning to discuss plans for Africa Open Science and Hardware, so I joined them, and we put together the first summit in 2018 in Kumasi, Ghana."

A WELCOMING COMMUNITY

"I connected with the global community and I got accepted for GOSH 2018 in China, but I couldn't attend, because of visas and other plans", he remembers. He kept in contact through the GOSH Forum. "It's a welcoming community, and it's always great to connect to other people. They are very open, people have been very supportive of my work. Beyond just having a global conference, they are actually interested in supporting initiatives at the regional level. That collaborative ethos is a great feature", he highlights.

ORGANISING AFRICA OSH SUMMIT

"To make sure that the focus areas that we choose are relevant and helpful to the community, we often go back to get their inputs", says Gameli. "For the event, we welcome contributions from people around the world, so we don't decide the program, but we open up the content. That also forms the basis of who we accept, because we want people who want to

“OUTSIDE EVERY IVORY TOWER”

participate and who are open to learning”, he remarks. “We are also very mindful of the financial aspect. While we don’t have the resources to support flights for everyone, we waive the participation fee for some people, especially local students”.

ON SELECTION

“It’s helpful to take time to study the ecosystem, to understand who the potential participants could be. In the application form, apart from collecting ideas, we ask about the organisational affiliations, to have an idea of the kinds of backgrounds that people are bringing. You try to reach out to the right communities, people who are already showing interest in what we do. We also look at gender, trying to ensure that we don’t have only a bunch of guys. We try to encourage more applicants”, explains Gameli. “Also, there is stronger participation of people from Ghana, Nigeria, South Africa and Kenya, countries with very vibrant tech ecosystems. We struggle to find people from other countries. So these are quite challenging things, like people needing access to the internet to even apply.”

FINDING YOUR PEOPLE

“Even within the academic community, these open mindsets are new. We are talking of going above and beyond the disciplinary confines, to a more interdisciplinary and participatory work, that should allow us to go outside every ivory tower. It’s not something for just people with PhDs in some universities, but we are trying to get everybody to connect”, remarks Gameli. “You don’t typically find people with similar mindsets in your everyday life. So when you come to a space where the next person to you, from a different country halfway across the world, shares that spirit, that open ethos, is like you found your people”, he says. And that translates into practice: “We asked people ‘what do you want to talk about’, ‘what’s your proposal’. So if your proposal is accepted, you feel ‘ok, I am contributing to this’, and so you are really looking forward to being part of it. Empowering everybody who has brilliant ideas to come forward to contribute is very important to create the right spirit. It’s all about trying to find the right people and help them to connect. And then of course, the unconference format also encourages participation”.

FAMILIARITY ALWAYS HELPS

“In Africa OSH summits, normally a bunch of us will come two days before the actual event to introduce ourselves, get to meet the local organisers, bond with them”, says Gameli. “In the last summit, we also had one day for visiting the local maker spaces and innovation hubs and universities. There’s already networking before the actual event starts. Familiarity always helps. We like to have a meal together, somewhere nice. We have parties almost every evening during the event. These social activities make things easier, more interesting and improve the overall experience.”

KEEP IN TOUCH

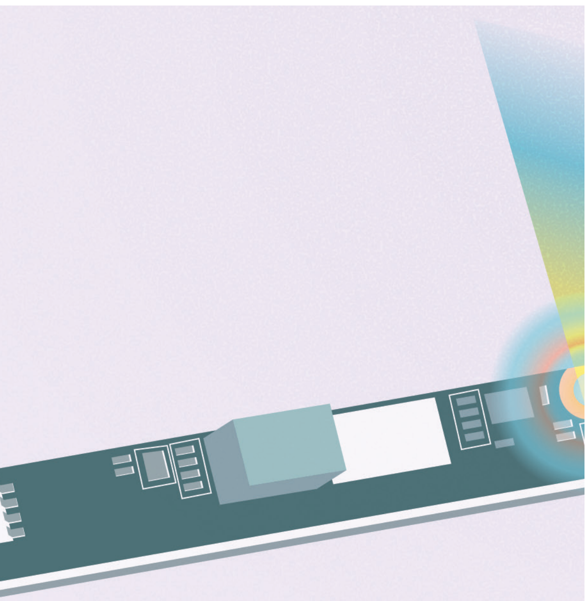
“With África OSH we do lots of social media content during the conference. After the events we share lots of pictures and videos on YouTube”, says Gameli. “We also have a WhatsApp group for Africa OSH to keep the conversation going. There are more than 80 people, we use it to share information about opportunities and updates.”

CONTEXT

“It’s really important to focus on local issues, and try to showcase the local country and city”, wraps up Gameli. “Be ready to experiment, and be confident: do things that work in your context, and not necessarily what other people would do.”

FRANÇOIS GREY

GOSH core organiser (2016 - 2018)
University of Geneva
Switzerland

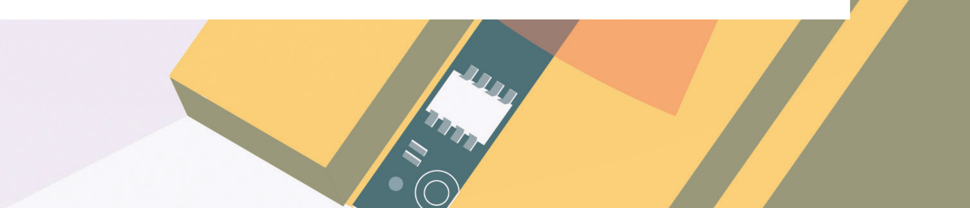


FRANÇOIS GREY is a physicist with a background in nanotechnology. In 2009, he helped launch the Citizen Cyberlab, a partnership between CERN, the UN Institute for Training and Research (UNITAR) and the University of Geneva, dedicated to rethinking public participation in research.

As its manager, he organised hackathons and hands-on events as tools for innovation. From 2008 to 2013 he was based in Beijing, where he helped establish the Open Wisdom Lab at Tsinghua University, In 2013, organising a summer school at Tsinghua, he decided to do something different. “I had a mentor, Heinrich Rohrer, who invented the Atomic Force Microscope, different from an optical one: you can see single atoms. He got a Nobel prize for that. It was a very expensive thing, about US$100.000, and he always teased me about how much we spend on equipment and how it wasn’t necessary. He said the problem with scientists is that they often buy very expensive equipment and they don’t spend time building it, and therefore they don’t really understand what it can do. That got me thinking”, he remembers. “In 2013 he passed away. To honor him, I transformed the summer school into an extended hackathon. I told the students ‘just build an atomic force microscope’, for under US$1,000. We got some funding from the Lego foundation and that was the LEGO2NANO summer school. It was a huge success with the students, who tried to do it open source. It’s quite difficult, but it was fascinating to see the reaction around the world to the idea that students could build such a device so cheaply”.

Around that time, while teaching at New York University, he heard about the work of Public Lab with open hardware and met Shannon Dosemagen. Back in Geneva, he learnt about the open source hardware license that Javier Serrano and colleagues had developed for CERN. “Discussing with him, I started to think: ‘why don’t we do an event to get everybody interested in open source hardware?’, he remembers. “Then I took some students to the Mozilla Festival, to present LEGO2NANO, where I met Jenny Molloy and heard about her research. That’s where I realised : ‘there’s a really diverse community around open source science hardware’”.

“When people say ‘open science’, they think of open access journals, open data repositories. Open source hardware is the little brother of the movement (or maybe the little sister): few people pay much attention to it, but its impact could



"HOW CAN GOSH MAKE THE MAXIMUM IMPACT?"

be immense given the amount of money, usually public, that's spent on science hardware", he remarks. "We had this idea to do an event, and CERN seemed a very exciting place for it, so in 2016 we organised the first Gathering for Open Science Hardware there. My main interest was saying: 'look, this is a big part of open science and needs some attention' ".

Since 2016 he is also director of the Geneva Tsinghua Initiative, an education programme for the SDGs with the universities of Geneva and Tsinghua. In 2018, he proposed the Tsinghua University graduate campus in Shenzhen as venue for the third GOSH, and brought in the local experts and organisers like David Li and Ji Li. "There is a lot of interest in China for Open Science Hardware, and it was exciting to connect with Shenzhen, which is China's Silicon Valley, when it comes to hardware", he says.

WHAT'S IN A NAME?

François gave GOSH its name. "I like to come up with funny acronyms. The right name can have a huge impact and the wrong name as well, so you have to be cautious. So I was looking for something that would be a little bit the playful spirit of what I hoped the community would be like", he remembers. "Sometimes names actually change your view of what you're doing. Now the G in GOSH, that was for 'gathering' is starting to evolve to 'global', the ambitions are bigger. That's fine, it's recycling, reusing. Trying to be more than a gathering makes sense".

CREATIVE TENSION

"The old conference style academic science event excluded a bunch of grassroots people. So we made it different, in very pragmatic ways: we made our meals together, some people brought their children to the event. Some of my CERN colleagues, who only had planned to come, give a talk and leave, were like 'wow this is really fun', and just kept coming back again and again during the whole gathering. That was unique in terms of different worlds meeting", says François. "Science is often associated with a formal academic system, but in open science and open hardware, a lot of the most exciting things are happening outside the structures, and the whole movement is challenging the establishment. This tension between establishment and non-establishment, academics and amateurs, is part of what makes GOSH unique. We need this tension. We can't change the establishment without the help of people in the establishment."

A SENSE OF URGENCY

"There's a sense of urgency in what we are doing. After COVID, the problems of the planet are right in front of our faces. GOSH can be part of the solution", he points out. "A big challenge is how to keep focused on the goal of the Roadmap, 'Make open science hardware ubiquitous by 2025', which is hugely ambitious. Some of what we do has to really move the needle on the agenda, the community has to stay focused, keep the sense of purpose. We're a network of influencers who should spend time trying to influence for a larger scale effect, because life is short. How do we find organisations where we could inject the GOSH DNA so that it spreads far and fast? "

"The history of modern academic science comes from events: academies were places where you had to demonstrate your results in public so people could reproduce them, otherwise it was not science", illustrates François. "Useful demonstration and documentation of Open Hardware needs to keep these scientific traditions. And we will need to treat GOSH events much more holistically. The big issue we have to tackle as a community is: How to get the maximum impact and influence out of future GOSH events?"

FERNANDO “NANO” CASTRO

Cooperativa Ayllu
Universidad Tecnológica Nacional
Argentina



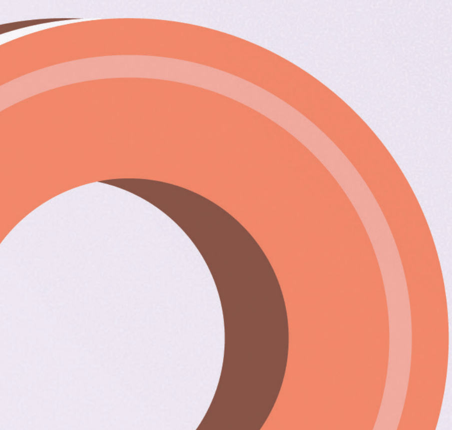
Fernando “Nano” Castro ran into open science hardware while studying for his PhD in atmospheric sciences in Mendoza, Argentina. “I couldn’t find a way to measure environmental pollution, it was very expensive, I had no way to validate my models. A colleague, a fan of free software, had introduced me to that world, so I told him ‘let’s try something together’. We started working with Arduino, without knowing there was a community. In that search, I ran into GOSH’s website, and I got to be the first Argentinian to sign the Manifesto”, he remembers. “I had published a couple of papers that nobody read, and I wanted to work on more concrete, applied-to-reality things, to generate some kind of change. Through a friend who works with a peasant organisation, I met Fernán Federici, who also wanted to get out of the glass tower. He invited me to the second gathering, in Chile, where the community blew my mind. I thought, “these are the people I have to work with”.

ORIENTED TOWARDS DOING

“One of the keys of GOSH is that discussions are always oriented towards doing. Doing is a strong key of the movement. The people who attend GOSH are quite down to earth. They are always thinking about doing hardware in the physical world, for real users, beyond ideas”, emphasised Nano. “The other key idea is the desire to share, everybody wants to share what they have and expects the same from others. In other places, people say ‘I did this by myself, it’s mine’. Here it is ‘look, I did this, tell me how you can contribute’. You are always hoping to be able to build on what the other person has done: we all bring our own little brick, feeling sure that what they are going to find in the other person’s bricks will be useful. People are interested in scientific success, but also in sharing it, so they open up. There is a click: I’m showing you my cards because I’m not playing against you, we are going to play together”.



“In GOSH I learnt the concept of unconference: ‘There is no conference, what do you want to talk about? That unstructured quality also has to do with the openness. It doesn’t have defined edges, it is rough, and in that roughness one can find things that, otherwise, I couldn’t find”, observes Nano. “Another key element of GOSH is the spirit of playfulness. I do things that don’t go anywhere. This playfulness blends with art, helps to avoid looking always for a purpose, and encourages exploration.”



"SHOWING YOUR CARDS TO PLAY TOGETHER"

PEER LEARNING

"Three months before GOSH 2018, I started talking in the GOSH forum about the chromatography workshop I was planning, trying to make sure that it would reach the people who could be interested, as far as possible. So when we arrived in Shenzhen, people already knew about the workshop and we could work together", he explains. "Fernán and I arrived some days in advance to organise the workshop. We had arranged to meet with Marc Dusseiller, so he called and we started working in the Open FIESTA. A week before the gathering started, I was already there with other people, sharing with other participants who were preparing their stuff. The place was ideal: we had a lab, tables, and computers. That's how I met several people with whom I was able to share more and do more things together", he highlights. "Then some people didn't attend the workshop because they had already got acquainted with the work and had talked to me earlier. It was very collaborative: in the end, I could perform the chromatography measurements because a lot of people helped me and taught me. I think the workshop was more to learn for me than for others, but that's the fun of workshops like this one: There's always someone that comes along and says 'I'm doing it this way, why don't you give it a try?' So it was collaborative, open and playful: we had a lot of fun".

The spirit of GOSH is flexible: "If you go to GOSH with an open mind, ready to do something different from what you had planned for your session, you will be fine. You have to be aware that what you prepared could be demolished because those who went to the workshop might be interested in just a piece of what you were doing, and that's OK. What happens there is right, you can't force a community to do something that you want", he reflects.

BUILDING BRIDGES

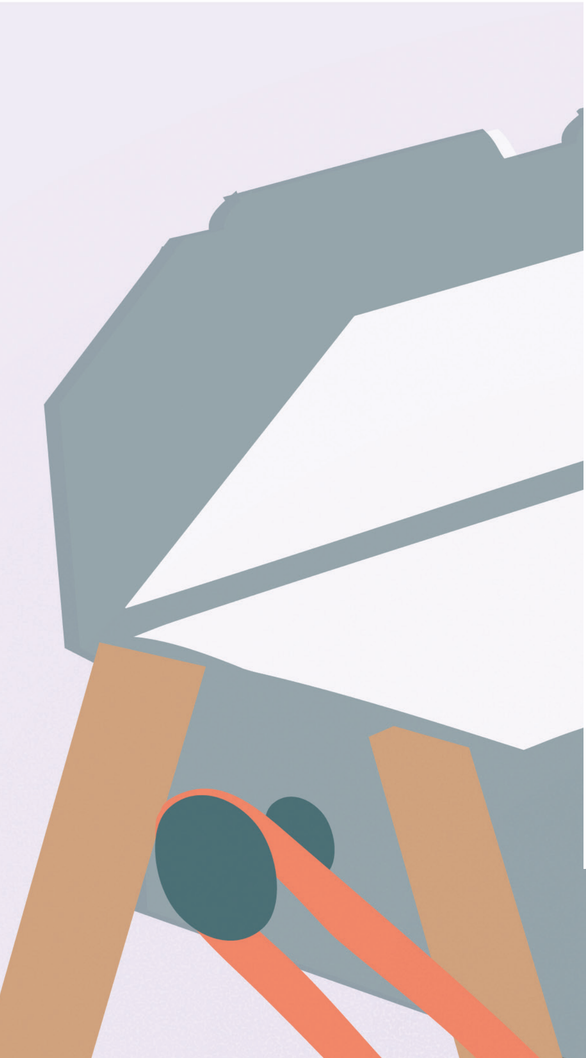
Nano started thinking about organising a GOSH event. "It's important to find a good place where we could work with freedom, in an institution that understands what we are doing, which is aligned with us. I would start spreading the word as soon as possible, trying to reach especially people from outside academia. In Mendoza (Argentina), we work inside the university to solve problems outside. Universities are bridges: if I go directly to a rural community and show them a device, they won't accept me. So I need to approach them from the university. Also some people are bridges to reach certain communities", he says.

"To hold an event, I would partner with like-minded people. People who are used to making things happen, who can sit down with the peasants and with the dean, who can solve a problem at the embassy or wash the dishes, going from bureaucratic issues to solving a conflict or simple things like caring about people", he details. "That involves having the values of the Manifesto built in: everyone who comes is important, it doesn't matter if they have published papers. It means being attentive to see how you can help, or how you can make people meet each other, catalysing the encounter. Because in the end, that's what the gatherings are for: 'look, you don't know each other but he's working on this and maybe you have something in common'. It's about giving all the conditions for people to meet".



FERNÁN FEDERICI

Lab de Tecnología Libre (iBio-PUC)
Pontificia Universidad Católica de Chile
Chile



FERNÁN FEDERICI is a researcher at iBio and PUC, Chile. He started as an agronomist in Mendoza, Argentina, and when he moved to biotechnology he was disturbed by the concentration of technological power. “The technology transfer was from collectives to individuals”, he says. During his PhD studies in Cambridge he met Jim Haseloff and Jenny Molloy, with whom he collaborated later as affiliated in the OpenPlant project. There he heard about free technologies and open hardware science. “I wanted to understand the idea of collective development, open technology transfer, and common knowledge that could be used for everyone. The hardware was just in the middle of all that”, he remembers. When Jenny Molloy told him about the first GOSH and shared the search for a place in the global south for the second one, he was just starting a lab at the Pontificia Universidad Católica, in Santiago de Chile, and volunteered as a local partner.

TECHNOLOGY BASED ON THE COMMUNITY

“What makes GOSH so special is the community. The people, their background and experiences”, remarks Fernán. “Through GOSH I’ve connected with people who were crucial for my work in academia. Open hardware solved microscopy problems that had been impossible for us to solve. In the education field, thanks to the GOSH network we got appliances and ideas to make boxes to send to the students during the lockdown. Without the GOSH forum and the open source projects, we could have never made it”, he explained. “The GOSH manifesto is important. It structures the way to approach technology based on the community, not the other way around. In other communities I’ve seen how the approach changes when the organising group changes one day it’s innovation, the other it’s academia… The manifesto sets the borders, where we are going, where the north star is.”

“I felt some of the innovation and technology communities I used to interact with at academic events were a bit detached from reality and local needs. GOSH lets you get acquainted very quickly, it makes you advance six pages at a time. Chatting with people, reading the manifesto, the roadmap and the code of conduct pushed me forward and helped me to avoid classic mistakes like thinking that with technology you can overcome all the problems. In GOSH you have a hundred people with their valuable experience giving you the state of the art, and making you conscious of

"TECHNOLOGY BASED ON THE COMMUNITY"

barriers and challenges", he highlights. "Besides the events, it's very important for the community to have goals, activities, commitments and checkpoints. This is not about going to an event, showing your stuff, and goodbye, see you in two years. There's a lot of collective work going on through the forum, in an array of sub-communities. I had never seen that".

LOCAL COMMITTEE

In GOSH 2017, Fernán led a team of nine volunteers who coordinated the venue, hotels, meals, visas, and other logistics in Santiago (Chile). "There are some basic things to handle: making sure everyone knows where they are going to stay, how to get there and move around, where to eat, where they shouldn't go. The forum has been pretty good at easing the anxiety on that. The local committee gives support when bad things happen: someone had an accident, someone got robbed… For taking care of visas, it was very useful to talk with the government and explain the event. That eased the paperwork in the consulates. In one week we took care of all of them. That's invisible work, but the equity principle is in the manifesto: we should support all the people who come to GOSH, especially those who need it the most. Some people had to go through four airports to arrive in Chile or travel to other cities to get their visas... You say 'science is for everyone', but in practice, you can see where the barriers are. The differences are overwhelming", he says. "It's also key to find a place where everyone could eat at the same time, and be together in the evening. Social and public events are crucial. We held a public evening where everyone could show something, some people made music or showed some devices, others stayed in the bar."

"To organise a new GOSH, I would involve people who have been in the organising committee before, and build on the manifesto. The code of conduct is very important. You can find it obvious, but once you see it in action… Some people said that without those specific spaces and facilitation techniques they would have never talked, because in their culture they are not used to talking about certain things", he says. "And I think that it's good to rotate the organising team, to decentralise. In 2017, all the press requests came to me, and there were another eight people, I didn't want that role. It would be great to designate a group to deal with the press, put together some stories to give to the journalists, and build bridges."

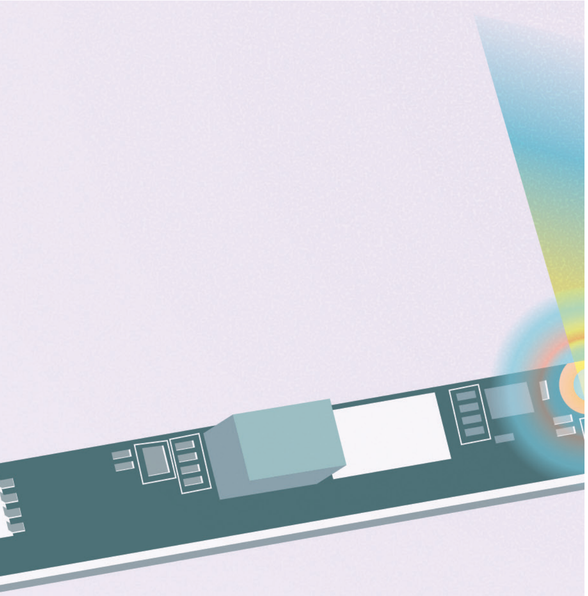
"For equity, it is very important to have funding to support the people who contribute to GOSH from outside academia", he adds. "It's not the same to get paid every month and be able to decide how to spend your time, or being a volunteer and dedicating hours that you take from other activities."

OUTREACH

"I've tried to reach people doing commercial open hardware, and community science groups. Whenever I give a talk I put a slide about GOSH, to invite students to join", says Fernán. "Those of us in academia should contact authorities, policy-makers and decision-makers around the event, and focus on people working on intellectual property and technology transfer. We should hear them, bring them into the discussions, understand their language, see why everything runs through individualistic mechanisms as patents. And also, tell them our story: why we think open hardware is interesting as a technological transfer mechanism. We should have much more participation there if we really want to change things", he emphasises. "Let's bring them to the event, let them see people from 40 countries doing open technologies, and show them the potential. It's an amazing opportunity, and we should try to make the most of it: bonding inside the community, but also outward interaction activities."

ANDY QUITMEYER

Digital Naturalism Laboratories
Panama



ANDY QUITMEYER is a professor, researcher and adventurer studying the intersections between wild animals and computational devices. With a background in engineering and digital media, he used to teach at the National University of Singapore, where he carried out academic research in digital naturalism, blending biological fieldwork and DIY digital crafting. He quit to start his own field-station makerspace in Gamboa, Panama: the Digital Naturalism Laboratories (the Institute for Interactive Jungle Crafts). He also hosted the survival tv series Hacking the Wild on Science Channel. In 2018 and 2019, he put up the Digital Naturalism Conferences, that had a first edition in Thailand and a second one in Panama. There he brought together over 100 participants from all fields to collaborate on finding new ways of interacting with nature, mainly investigating interactive tool-making in the setting of their own DIY biological field station. All of their work was published openly for sharing and remixing.

He got to GOSH through Hackteria. “I met them like 10 years ago. They’re great, do all kinds of cool biopunk stuff, DIY bio, awesome things. They helped connect with lots of other really great organizations, and then I heard about the GOSH meeting in Chile. I had also been following the people from Public Lab for quite some time, so it seemed to me like GOSH is a little baby of those two groups, Hackteria and Public Lab”, says Andy. “Then the Africa OSH Summit in Ghana came up, and luckily I got to attend that. It was really wonderful to meet all those people”. Some months later, he was part of the third Global GOSH, in Shenzhen.

CHANGING THE CULTURE OF SCIENTIFIC SECRECY

“I first approached GOSH more as an open source free culture advocate, mainly in interaction design, interactive media and interactive art”, remembers Andy. “A little bit later I started doing interactive media with animals and other non-human living creatures. I like the ethos of open source hardware, sharing and building upon each other’s work, using open source platforms like Arduino. This way I don’t have to reinvent how to make a programmable microcontroller, I can just use it and it’s wonderful, and then I can share my stuff and other people can use that and we can all help advance each other”.

“Not only is it very nice to make this hardware and software open source and share it with everybody, but ethically

"ETHICALLY IT SHOULD BE MANDATORY TO SHARE"

it should be mandatory", states Andy. "It was disheartening when I started getting involved with many science people who were like: 'okay we're doing this secret thing, don't leak any of my information, I don't want to get scooped'. I thought that was just so silly! So it was really nice for me to find the GOSH community".

"GOSH gets a bunch of people across many different disciplines, or even without any, with the same goal: sharing open science stuff. These people normally would never have crossed paths for any reason, except they're both there and they both want to share. Being there and sharing is the key element. The openness gives everything a completely different vibe. It's refreshing seeing people be like: 'look at this cool thing' rather than 'look at my cool thing'.

MAKE, SHARE, DOCUMENT

"In Ghana we actually got the people to go out to a nearby forest. We put down picnic blankets, I had my backpacks that turned into hacking gear and we set those up outside, underneath all these fruit bats that were flying around, and we just let people play around with sensors and test things. That was super fun", recalls Andy. "Then at Shenzhen, I ran a workshop that was more about this design fiction, like drawing your ideal field tools or workstations or wearable field kits. It was pretty fun."

"I try to share these concepts of openness and sharing. For the conference that I run, DINACON, we carry over this concept from GOSH. We have very simple open-ended rules for participating in our conference, where open-ended means you aren't targeting a specific outcome. The rules are: you have to make something, you have to share it with others, and you have to document it".

INCLUSIVE PLANNING

"I'm a big fan of punctuality, and planning out your sessions within the time constraints. That can become an issue of inclusion, because especially when you're in a very open-ended atmosphere, where there is not one precise thing to be done and who knows what's going to happen, people can be like 'oh this is a very chill atmosphere, I was giving a one hour session but let's make it two'", warns Andy. "That can happen, but I think it interferes with people's schedules and sessions. Think through the steps of your session, and be mindful of the time: you're actually negotiating with lots of different people from very diverse backgrounds. If you plan your workshop for half the length of what you might think it actually takes, you have plenty of time for discussion, for probing around and you're not hogging up anyone else's session time, you're not preventing the people from joining the other sessions they may have already signed up for."

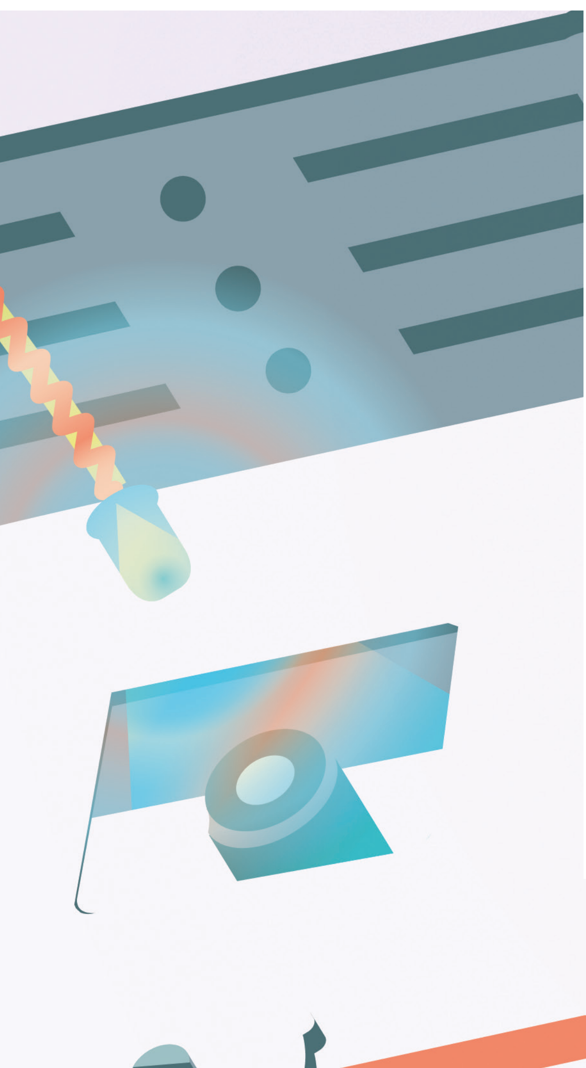
HELP CALM PEOPLE'S FEARS

"If you're facilitating a session, you need to block out time for yourself to pay attention to people's emotions and behaviors on top of running the whole session. And try to be nice and open with them", says Andy. "You should be conscious of who's talking the most and try to encourage others. Try to shift the focus, to make sure that everyone's getting a fair share. Just try to create opportunities and spaces for people to participate, but don't put people on the spot and force them to speak".

"I would have people asking "oh I don't know anything about Arduino, is it okay if I join?". Trying to help calm people's fears can be important", highlights Andy. "It's just about being available to chat before the workshop and answer questions or concerns. I also suggest being very open to changes."

ANDRÉ MAIA CHAGAS

Department of Neurosciences, University of Sussex
United Kingdom



André Maia Chagas is a researcher and open science hardware developer with a background in neurosciences. "I did my bachelor's in Brazil, and I went to Germany for a master's degree. One day in I was sitting in the lab and there was 60.000 euros worth of equipment in front of me, just for one experiment", remembers André. "I thought: 'I'm glad I can do these things, but if I ever want to go back to Brazil then 60.000 euros worth of equipment is basically like a good two-year salary. There needs to be a way to do these things more affordable. This got me looking for open source hardware alternatives, because I had already played around with Linux. I discovered Arduino and some platforms that got me to open source hardware". He started a user-driven database of open neuroscience projects. "Price is not the main issue with open hardware, but it's what gets you hooked. Then you start realising other things that come with openness", says André. "Eventually this became the main focus of my PhD, and now I work full time as an open science hardware developer to support research at the Department of Neurosciences at the University of Sussex".

In 2015 he attended an event in Cambridge and showed a microscope he had built for US$100. There he met Jenny Molloy, who was talking about the first GOSH event, planned for 2016 in CERN. André applied. "Coming from a very traditional academic background, it was a bit difficult for me to digest the format of unconference. To be honest, I was thinking 'is this really important?' The second day I started to realize that people were discussing topics that normally are only discussed in the hallways, and this was the main focus."

Next year he attended the second gathering, in Chile. "This was when I had the most fun with GOSH, because there was a lot of effort to make it a really diverse space. I remember talking to people that I never thought I would ever have the opportunity to meet in my life. The way people saw even little things that you take for granted, that you don't even think about, was very interesting", he highlights. At that time he was volunteering at Trend in Africa traveling and convening workshops. "One of the biggest impacts GOSH had on me was about what it actually means to be a person who's not considered normal, who doesn't feel welcome in spaces where everybody should. In GOSH 2017 I absorbed so much that it really changed the way I was doing these workshops."

ENOUGH EYEBALLS

"In Chile we tried to have a 50-50 gender balance for the workshops, but it was not enough if only men were speaking",

"AS IF HUMANS GOT IT RIGHT"

remarks André. "How to make sure that everybody gets heard? How to make room for the introverted who have great ideas to be comfortable and share them? That is important, even if only for personal benefit, to get to know amazing people doing great things. They normally would never have said a word, and they talked because they were given a chance. Everybody benefited: more diverse people talking means more brains tackling the same issues. It is this maxima from open source: given enough eyeballs, all the problems become more trivial. So by raising these voices, you have more eyeballs on the problem to solve it."

TRAINING RESPECT

"The GOSH events look a little as if humans got it right", says Andre. "People are what they are, it's simply about respecting the person who's next to you", he adds. "If you prepare the participants for something, you have to deliver that. If you said that everybody's getting time to be heard, then make sure that happens, otherwise you fall into participative washing".

"It requires a lot of effort to bring all these people and remind them 'look, it's a different approach here'", he highlights. "It rests a lot on the experiences of people that have been doing this for a while". He proposes "to offer training to pass on the knowledge" in a "kind of a mentoring program or a workshop". "I think a lot of people in GOSH would be super interested in this, although it sounds like just a maintenance or a housekeeping job".

MAINTENANCE

"A lot of the things I did in GOSH were remote, or off conference times: an informal workshop with Fernán and Nano before the 2018 GOSH, a lot of things in the forum. When the 2018 goals were set, I wrote to people trying to keep them on track", he says. "This is also an art: trying to keep in touch with people. This could be super informal, just a couple of messages: it also costs time. I realized how this maintenance is a hard job: chatting to GOSH people over time, listening to a lot of ideas, or offering myself as a sounding board for others to explore and think about things."

For example, in 2019 I got a Mozilla fellowship, I did a survey and people said what kind of equipment they needed for research in the labs. Then I had a little bit of funding to pay for parts. A lot of the people who built were actually people from GOSH: Thomas in Cameroon, Nano in Argentina... So most of the interactions that I had in the community were not necessarily at the events but before and after. But they're only possible because of the events where I met the people: doing things together you get a feel for whether you like the way someone works or not. Then they become part of a network, an opportunity to try to elevate each other. There were a lot of collaborations."

REAL INTERACTION

"Try to interact with people that you wouldn't normally feel inclined to interact with, to avoid your bias. You have to be prepared to listen to things in a different way and try to understand what they are saying, not only listen so that you can think about an answer. This is the real interaction, this is how you find surprising ideas".

JI LI

Manager of Open FIESTA
Tsinghua University
China

Ji Li is a biologist with a background in animal genetics, focused on the intersection between open science and the sustainable development goals (SDG) by training. Since 2015 he is the lab manager and engineer of Open FIESTA (Open Faculty for Innovation, Education, Science, Technology and Art), the innovation lab of Tsinghua University in Shenzhen. He was also part of the team that designed and built Open FIESTA's interdisciplinary labs. There he hosted several international events, including the third GOSH meeting, in 2018.

"It was a privilege to meet all kinds of different people being host and organiser for the last GOSH gathering. I'm always quite interested in interdisciplinary things, and find that open science and open source movement are fascinating, especially the culture of openness. I always believe that open source is the future. In China we don't have that culture yet, so it was quite interesting to host the GOSH event here", he says. "François Grey introduced Open FIESTA to GOSH, because we had common interests. Open Fiesta was a new education programme where we were trying to do something different, including taking students from different backgrounds and emphasising openness. We had done some workshops on open science hardware and the Sustainable Development Goals (SDG). GOSH organisers were looking for a venue and they found Open FIESTA perfect. Shenzhen is a key city for hardware, and we have connections with maker spaces, hardware ecosystems, and open hardware projects. We also have a bond with the people of the Shenzhen Open Innovation Lab, who were kind of co-hosts, and helped a lot."

OPEN FIESTA

"As I'm the lab manager in the Open FIESTA, we enjoyed a lot of freedom. It's a place where you can set up DIY equipment in bios labs, make full use of every small room, draw or break things, anytime, anywhere. It seems quite chaotic and disordered but it was what a GOSH event venue looks like", says Ji. "Some people came one week early and they prepared their workshops for several days. They really made full use of the place and the equipment", he remarks. "If you rent a fancy place, like a conference hall, you'll probably have more restrictions. As we kind of owned the Open FIESTA, people could stay anytime. The last day people danced there, it was a great moment", he recalls. "We also had this party in the X Factory, which is also a perfect place, where people brought their projects, showed them and played music. I also remember that many people explored unique things of the Chinese culture,

"CREATE THE ENVIRONMENT TO EXPLORE"

like Chinese street food at night. So I guess that happened probably due to the freedom of the space, showing that Open FIESTA was the perfect venue for GOSH."

CHALLENGES

"The biggest challenge was the cultural differences. We had to pre-think everything, like the food: some people don't eat pork, some don't eat beef, there are vegetarians and vegans. There is some sacrifice in being the host, because you have to deal with many people who come and say they need help with different situations, due to the language barrier and cultural differences. As in China Google and Facebook are blocked, many people had difficulties, and needed a VPN, and installing WeChat to communicate. Luckily we counted on a team of volunteers, mainly university students. Also Besar Zasella [who joined GOSH as an intern of the Shenzhen Open Innovation Lab] was really helpful, as he had a foreigner's perspective, and that helped him to put together guides and materials to publish in GOSH forum and prepare the participants to be ready for China".

Another challenge was the documentation process. "I think one thing very special about GOSH is the unconference format, and that can be hard to document", states Ji. "When you see a traditional conference it's quite easy to do it, you can set up the cameras, there's one speaker, then you probably will record everything. But this format is different, it's not easy to keep records, because each group, each session, needs a person to register it", he remarks. "We tried to document as much as possible, but still there's probably something we failed or didn't do after all. It was really challenging, you need to summarize the whole conference".

Looking back, Ji regrets: "The worst part was the issues with visas. Some people couldn't attend the meeting. We didn't prepare well for that, it takes a much longer process for some countries to get a visa to enter China. I joined the organiser team ten months before the event and helped prepare the programme. I thought it was very early. But we should have started working one year before the date of the gathering. That way we could have selected people early enough to give them time to deal with the visa processes and set up their schedules".

CREATING A CULTURE OF OPENNESS

"The very key element of GOSH is the active community from different backgrounds, from all over the world. Generally in conferences the people who join are those who work in a certain area, you hardly see a community so diverse, with gender balance, people from developing countries, giving more opportunities for those with less resources", says Ji.

"I think that it's quite important to create this culture for people to try different things, to explore the different cultures, and to communicate with people from a different background. That's something I find quite fascinating from GOSH: that we created our environment", he highlights. "I remember, for example, that there was a biology group and other people who have never done biology before, and they tried something new. Some of the people tried to eat insects, they had never tried before and then they did it in the GOSH event. Also putting together these people from different cultural backgrounds makes great communities, as community innovation abilities currently depend on diversity. So it's very important for future organisers to create and promote a culture of openness, encouraging people to explore new things and communicate with different kinds of people."

Gathering for Open
Science Hardware